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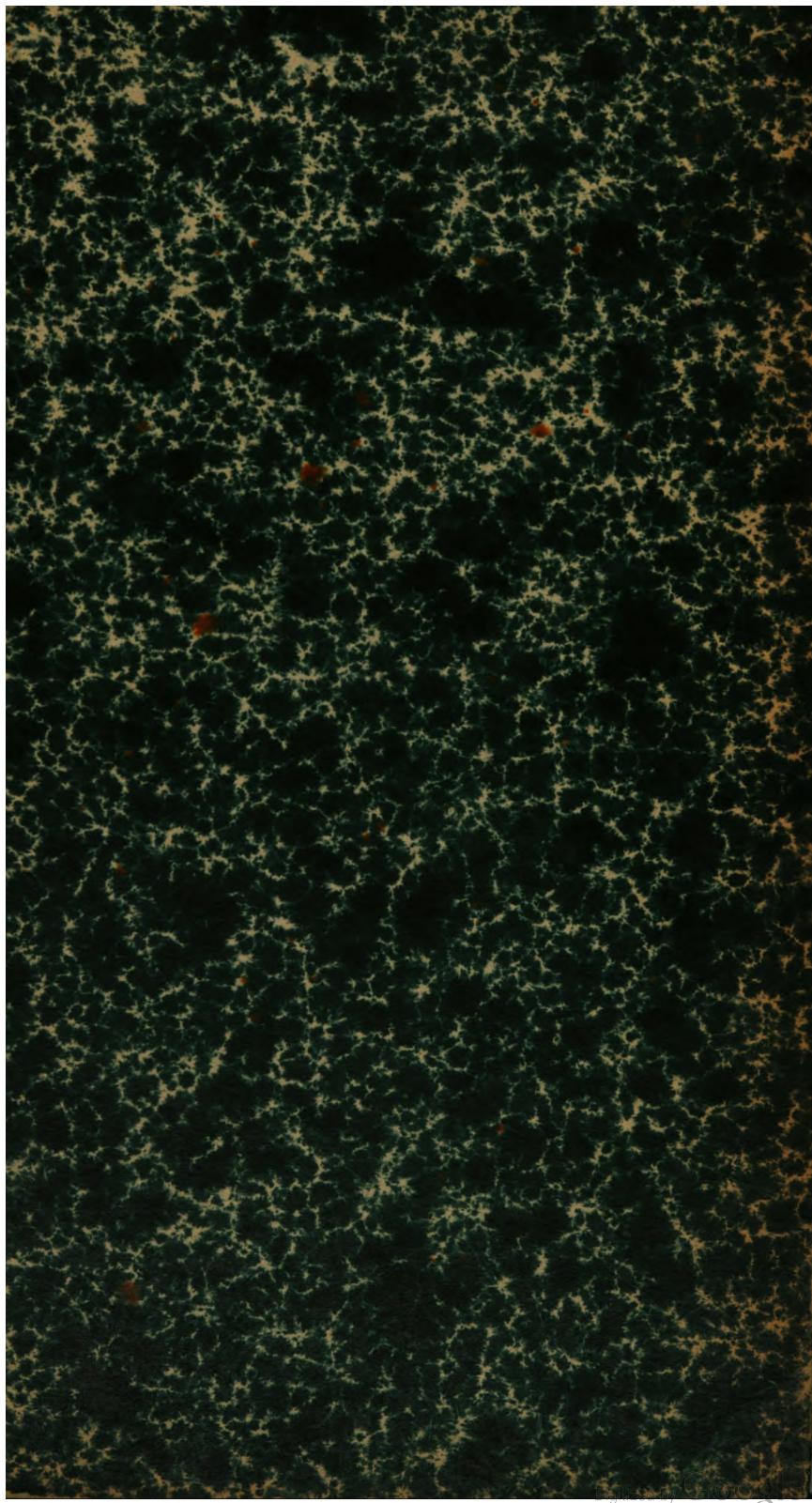
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PROCEEDINGS

OF THE

2043b

TWELFTH ANNUAL MEETING

ADDITION

OFFICERS FOR 1897-98

PRESIDENT, BENJ. LEE,
1532 Pine Street, Philadelphia, Pa.

VICE-PRESIDENT, F. FORMENTO,
109 Bourbon Street, New Orleans, La.

TREASURER, ELZEAR PELLETIER,
Montreal, Que., Canada.

SECRETARY, J. N. HURTY,
Indianapolis, Ind.

CORRECTION

Page 8, Report of Special Committee on Finance, the statement is made, that "no voucher was found for the charge of D. L. Levy for \$125.20 for reporting the meeting of 1896." *Voucher was afterward found.*

INDIANAPOLIS
CARLON & HOLLENBECK, PRINTERS
1898

PROCEEDINGS

OF THE

2043b

TWELFTH ANNUAL MEETING

OF THE

CONFERENCE OF STATE

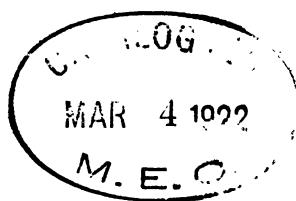
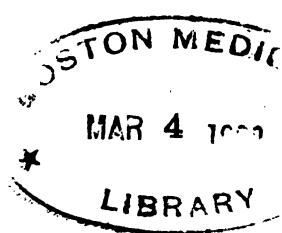
AND

PROVINCIAL BOARDS OF HEALTH

OF NORTH AMERICA

NASHVILLE, TENNESSEE, AUGUST 18TH, 1897

INDIANAPOLIS
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PROCEEDINGS.

The Twelfth Annual Meeting of the National Conference of State Boards of Health was called to order promptly at 10 a. m., August 18, 1897, by Dr. J. A. Albright, of Somerville, Tenn.

Dr. C. A. Ruggles, California, President, in the chair, and Dr. E. A. Guilbert, Iowa, acted as Secretary in the absence of Dr. C. O. Probst, of Columbus, Ohio.

After prayer by Rev. John D. Morris, Chancellor, Nashville, Tenn., on behalf of the Governor, Maj. Jno. P. McCann welcomed the delegates to Tennessee in the following words :

Mr. Chairman, Ladies and Gentlemen of the National Conference of the State Boards of Health: The absence of the Governor, who was to deliver the address of welcome to you, imposes that duty upon me. And in the name of our great state, in the name of our hospitable city, on behalf of the management of the Tennessee Centennial, yea, on behalf of all the people, we bid you a cordial welcome within our borders, and within the sacred circle of national friendship, and beg to assure you that we indulge in no mere oral service when we say so.

The experience of the past has indelibly impressed upon our minds the truth of the aphorism taught us in childhood, "Be not forgetful to entertain strangers, for thereby many have entertained angels unawares." I suppose the inspired writer had no conception of the size of the sleeves to be worn by our modern sisters, else he would have taken them for wings and concluded that the proposition was half fulfilled to start upon.

But I want to say, with all the emphasis of my soul, that the brethren are not far behind them in all the graces which tend to bind us in the bonds of a holy and fraternal love. I do not desire that the sons of Esculapius should imagine that I am putting them on an even footing, although their pedal ornaments are usually from five to ten numbers larger than those of our female friends. I am simply trying to put them on the horizon, while I soar away to the zenith with their better halves.

If any of you should feel poor in spirit, rejoice in the fact that you are a millionaire so far as your present visit is concerned. You own this town, boots and breeches. We delight to honor you, and intend to do everything we know how to make your stay bright and pleasant while in our city. If we do not succeed in one direction, we will give you a practical dose of spiritus frumenti Gallici. And we are sure when you have taken the dose you will not be brought from a perpendicular to a horizontal, nor have one headache in a million years.

But I digress. Your business is to stand as sentinels upon the watchtower and prevent the introduction of diseases of any kind, and if they should escape your everwatchful eyes, and obtain a sporadic footing, your efforts are to prevent their spread in epidemic form.

There is an old medical saw which says that an ounce of prevention is better than a pound of cure. If any one ever doubts the proposition you

can prove it by me, for the Lord only knows how many stomach aches I have avoided by putting on a Tennessee overcoat to avoid them. Lest some of the ladies may not understand what a Tennessee overcoat is, I rise to remark that it is composed of one part water and ninety-nine parts bug juice. I believe, Dr. Lindsley, this is about the average percentage, is it not?

And when, in the language of the Governor of North Carolina to the Governor of South Carolina, it is found that it was a long time between doses, and a poor wayfaring victim fell by the wayside, the ambulance corps, in the shape of the patrol wagon, was always at hand, and the spieler, in the shape of a policeman, never failed to get in his work.

Some one has said that partial evil is universal good. How we Americans do progress! I see that even this convention has caught the cure, and the President of the National Board of Undertakers is on time, while the light radiating from the countenance of the Superintendent of National Transportation over there seems to say that "hope springs eternal in the human breast," and there is a case or two in sight. But I want to warn him just here that his business will be light. I remember distinctly that nearly half a century ago, when a beardless boy, I was doing my best to build up the city, the cholera slipped in on us, and was killing the people a little faster than we could bury them. A stranger said to one of our city wags, "I thought people did not die often here." He replied that the statement was true, and when they died once they buried them, and that was the last die they had at it.

Now, Mr. Chairman, I am powerful glad to see you. For six or seven years of my life I was afflicted with gall stones. How often I watched the coming of the faithful physician, as he would give me an anesthetic and restore me immediately from damnation to salvation. Some fellow has said that the entire system changes every seven years. I am not going to debate the question whether time or the doctors cured me. I will, however, settle the question by saying that, like most of the human race, as I have not settled my doctor's bills as promptly as I should, I will now even up on gratitude toward the fraternity.

The first one comes from my heart, and I will settle it if it stops the machinery of existence. The other comes from pantaloons' pocket, and every body will tell you that I am a miller and will blow you in wherever you wish to be blown.

Aside now, Mr. Chairman, from levity, and assuring you again of a hearty welcome, you attend to the business which called you together, and I will take these good-looking girls, this whole row of chimes you have brought with you, immediately in hand, and if the town is not heated red hot, it will not be for the lack of a bevy of angels, with the accompaniment of the best-looking fellow there is in the whole show.

Boys, don't be alarmed; we will return them to you in perfect safety, and to-morrow night we will give you a round-up in the shape of a grand reception by the Women's Board of the Tennessee Centennial.

We have not yet completed the program of general entertainment, but I beg to assure you it will be up-to-date on sanitation and expectation.

Wishing you now a successful session, that each and every one of you shall be as wise as owls and as harmless as doves, we say au revoir.

The delegates were then welcomed to and given the freedom of the city by Dr. N. G. Tucker, of Nashville, in the following words :

Mr. President and Gentlemen of the Convention, unlike my distinguished friend Maj. McCann, upon receiving a notice that I was assigned the duty of welcoming you to this city, on behalf of its Mayor, who could not be present, I did not proceed to compile from fourteen to eighteen sheets of

foolscap. I am simply here to say to you, gentlemen, that we are glad to have you here.

The Mayor, who is very unwell, asked me, as the Health Officer of the city of Nashville, to welcome you to this city, and to throw the gates as wide open as possible for your enjoyment, and trust that you will have a profitable meeting.

I say to you, gentlemen, that we regard it as a very great honor to have such a large number of distinguished gentlemen from nearly every State in our Union, coming to meet us here in the capital of our State, to discuss questions not how to cure disease, but how to prevent disease—how to keep people from getting sick—a most important part of a physician's duties.

I say to you, gentlemen, that I prepared no set speech, but as the Health Officer of this city, and in behalf of the Mayor, and on behalf of the citizens of Nashville, we welcome you to our State, to the hospitality of our city, and to our exposition, and we will do all in our power to make your visit a pleasant one, both to the ladies and gentlemen.

We welcome you, ladies and gentlemen, from the lakes on the north to the gulf on the south, from the heights of Abraham to that little village away down on our western shore, I believe they call it the village of Stockton, California. On behalf of the Mayor, ladies, and gentlemen, I take the bridle off, and give you the freedom of the city, and you can make yourselves perfectly at home.

Dr. Albright then introduced the President of the Conference, Dr. C. A. Ruggles, of Stockton, California, who responded to the address of welcome as follows :

We have listened with rapt attention to the words of greeting spoken by the representative of the Governor of the State of Tennessee, and of His Honor the Mayor of the city of Nashville. To those of our number who were here in 1890, and experienced the hospitality of the fair city of Nashville, the capital of the beautiful State of Tennessee, these words of welcome are not empty—they are not void, nor meaningless. And to you, gentlemen, who may not have been fortunate enough to have been here in 1890, I dare predict that when this session closes you will, with unanimity, universally, and with one accord, say it is well that we were here.

Now, as President of the Twelfth Annual Conference of the State Boards of Health, and in the name of that body, I thank these gentlemen for their words of welcome and greeting, and I trust that nothing will happen to mar the pleasure or profit of our meeting, and I am sure that nothing will. Again, gentlemen, I thank you for your words of welcome.

I am sorry to announce to the members of the Conference the absence of the Secretary, Dr. C. O. Probst, of Columbus, Ohio, and I now appoint Dr. E. A. Guibert, of Iowa, to officiate in his place.

Dr. Benj. Lee, of Pennsylvania, offered the following resolution :

Resolved, That the members of the Tennessee Health Officers' Association, about to be organized in this city, be invited to participate as visiting members, in the deliberations of this Conference.

Upon proper motion, duly seconded, resolution was adopted.

DR. SCHRADER, Iowa: I would suggest, Mr. President, that there should be a financial committee appointed early

in the session to look over the books of Dr. Probst, the Secretary and Treasurer of this Association, in order that an early report may be made to let us know our actual financial condition, that we may know just where we stand.

PRESIDENT: That matter will be attended to at the very first opportunity.

PRESIDENT: Members of the Twelfth Annual Conference of the State Boards of Health herein assembled, and ladies and gentlemen: It has ever been the custom for the presiding officer of this body to make what is called an introductory address. At this particular time that custom will be more honored in the breech than in the observance. Our time is limited, and our work is large, therefore the less time consumed on unimportant matters the better.

I am very glad to see so many members present, and I predict a very profitable and instructive Conference.

There are matters of great importance to be brought before this Conference—matters in which the whole country is interested.

I am glad to see so much space on the programme given to the subject of Tuberculosis, and I hope the papers will be very freely discussed, this disease being one of the greatest enemies of the human family.

I congratulate you, gentlemen, as sanitary representatives and custodians of the public health, that our country has been comparatively free from epidemics during the past thirteen months. To be sure, some portions of the country have been visited by Small-pox, and other portions by Diphtheria, but there has been no general epidemic.

I wish to say in this connection that I regret exceedingly that there is a ruffled condition between the United States quarantine officials and some of the State authorities, and trust that these matters will finally be settled to the satisfaction of all, and to the best interests of the country at large.

The programme of the meeting is before you, and I hope all the papers will receive a full discussion.

I hope and trust that the Twelfth Annual Conference of the State Boards of Health will be exceedingly profitable to the delegates attending and to the country at large.

The Secretary will please call the roll of States.

The Secretary then called the roll and the following States responded:

Alabama—W. H. Sanders.

California—C. A. Ruggles.

Connecticut—William H. Brewer and R. S. Goodwin.
Rhode Island—G. T. Swarts.
Pennsylvania—Benjamin Lee.
Ohio—R. D. Kahle and J. C. Crossley.
Kentucky—J. H. Samuel.
Tennessee—Dr. J. B. Lindsley and other members of the State Board of Health.
Louisiana—Dr. Felix Formento and Dr. G. F. Patton.
South Carolina—James Evans.
North Carolina—R. H. Lewis.
Virginia—T. A. Irving.
Michigan—Frank Wells and Henry B. Baker.
Illinois—C. B. Johnson.
Wisconsin—U. O. B. Wingate and Q. O. Sutherland.
Minnesota—H. M. Bracken.
Iowa—E. A. Guilbert and J. C. Schrader.
Texas—R. M. Swearingen.
Maryland—James F. McShane and John S. Fulton.
Province of Quebec—Dr. Elzear Pelletier.
Indiana—J. N. Hurty.

The President—It becomes my painful duty to announce the death of Dr. Jerome Cochran, of Alabama, which has occurred since the last meeting of this Conference in June, 1896. Dr. Cochran was a zealous and energetic member of this Conference. My acquaintance with him commenced, I think, in 1890, and I might say the better I knew him, the better I liked him. He was zealous, enthusiastic, diligent and honest. He is now gone from amongst us. Peace be to his ashes, and green ever be his memory.

President—I will now appoint Dr. Formento, of Louisiana; Dr. Lewis, of North Carolina, and Dr. Hurty, of Indiana, as a finance committee, to audit the accounts of Dr. C. O. Probst, the Secretary and Treasurer.

This committee handed in the following report:

FINANCE

REPORT OF SPECIAL COMMITTEE.

Your Committee on Finance has the honor to report as follows:

FINANCIAL STATEMENT OF THE NATIONAL CONFERENCE OF STATE BOARDS
OF HEALTH FROM JUNE 10, 1896, TO AUGUST 18, 1897.

	<i>Dr.</i>	<i>Cr.</i>
Cash on hand June 10, 1896	\$206 57	
To annual dues, 1894, from Quebec, Illinois, North Carolina, Rhode Island and Maryland, each \$15	75 00	
To annual dues, 1896, from Alabama, New Jersey, West Virginia, Indiana, Louisiana, Iowa, Wisconsin, Delaware, South Carolina, Massachusetts, Maine, Michigan, Ohio, Quebec, Novo Scotia, Pennsylvania, Illinois, North Carolina and Rhode Island, each \$10	190 00	
Telegram, Dr. Swarts	\$0 50	
Stamps, Columbus Postoffice	5 00	
Reporting meeting, 1896, D. L. Levy	125 20	
Printing Proceedings, 1896, Columbus <i>Express</i>	340 00	
Cash on hand August 18, 1897	87	
 Total	 \$471 57	 \$471 57

We find the figures given to be correct, but no voucher was found for the charge of D. L. Levy for \$125.20, for reporting the meeting of 1896.

The bill of Columbus *Express* for printing proceedings of 1896 was \$418.50, on which is credited \$340, leaving a balance due of \$78.50.

We find an unreceipted bill of U. S. Express Co., for distribution of copies of proceedings, \$38.86. Assuming this to be unpaid the total indebtedness of the Conference amounts to \$117.36, less balance on hand 86 cents, leaves a net apparent deficit of \$116.49.

RECOMMENDATIONS.

The committee offers the following recommendations:

- (1) That the publication of the proceedings be referred to the Executive Committee with power to act, and that they be instructed to have a sufficient number of copies printed to supply one to each member of the State and Provincial Boards of Health represented in this conference.
- (2) That the offer of *Public Health*, W. B. Atkinson, editor, in this connection, be referred to the same committee.
- (3) That the Executive Committee be authorized and instructed to fix the annual dues for 1897 at such a sum as will be necessary to pay outstanding debts and all expenses of the current year. Signed,

FELIX FORMENTO,
R. H. LEWIS,
J. N. HURTY.

Upon motion, properly seconded, report of the Finance Committee was accepted.

After considerable discussion its provisions were adopted.

1. PROPOSED BY THE STATE BOARD OF HEALTH OF SOUTH CAROLINA:

"SHOULD THE TUBERCULOUS INSANE BE ISOLATED FROM OTHER INMATES IN OUR ASYLUMS AND ACCOMMODATIONS PROVIDED FOR THEM IN SEPARATE AND DETACHED BUILDINGS?"

Discussion to be opened by Dr. H. M. Bracken, of Minnesota.

I am asked to open the discussion on this question.

Truly it seems like an unnecessary question when we consider the infectious character of this disease. Why not ask, "Shall we kill off our insane?" If this were answered in the affirmative, we might then ask, "Why not choose some more humane method of destroying these unfortunates than by forcing upon them the slow torture of this slowly progressing disease? Why not, in preference, produce anesthesia by means of morphine or some kindred acting drug?"

Would we think of allowing those suffering from Smallpox, from Diphtheria, from Yellow Fever, to be housed with the uninfected? Then why should we consider for one moment the question of subjecting the non-tuberculous insane to an exposure more deadly in its effects than that of any of these diseases?

But you may say there is a close relationship between Tuberculosis and Insanity. That there is a so-called phthisical insanity said to occur sometimes in persons of the phthisical diathesis, who have no symptoms of local tubercular deposit, and you may quote Maudsley as saying that "without doubt many phthisical persons exhibit features of character in some respects peculiar." People whom he describes as "quick, irritable, fanciful, idealistic, but unstable of purpose; brilliant in flashes, but wanting in breadth and calm depth of thought; quick in insight and intense in energy." People with "a sort of hectic in their thoughts, feelings and actions."

You may tell me that "with Phthisis there commonly goes a particularly intense, impulsive and sanguine temperament, which may breed a more insanely disposed temperament in the offspring, apart from any influence which the actual tubercular tendency may be supposed to have or to have not."

You may quote Clouston, who "more than thirty years

ago described a form of insanity peculiar to persons of the phthisical type and their offspring," and who has further stated that "the hereditary disposition to insanity existed in 7 per cent. more of the insane who were tubercular than of the insane generally."

You may quote Dr. Strahan, who says, that "the phthisical and the insane diatheses are interchangeable is proved to the asylum physician every day."

You may excuse neglect of isolating the tuberculous insane on the score that the ordinary distressful symptoms, pain, dyspnœa, cough, hemorrhage, etc., are generally absent among the insane.

You may tell me further that "Tuberculosis is the *assigned* cause of death in from 28 to 33 per cent. of the whole number of deaths in many lunatic asylums," and yet that "Phthisis is probably the *assigned* cause of death in only a little more than half of the cases in which Tuberculosis is present."

You may use all this evidence to prove the uselessness of the precautions that are ordinarily taken to prevent infection from Tuberculosis.

Admitting these statements to be true, we may still ask: are we justified in housing the tuberculous and the non-tuberculous insane together? I think not. But must we admit these statements unqualifiedly? It is not becoming in me to criticise the conclusions of such eminent alienists as I have quoted, but may I suggest that had their study of Tuberculosis among the insane been carried on with our present knowledge of this disease, their line of reasoning and their final conclusions might have been quite different.

Let us hear some testimony from the other side.

In a paper by Dr. Geo. H. Rohé, upon sanitation in hospitals for the insane, he says: "The greatest scourge of these institutions is Tuberculosis, and I fear the apathy with which this disease is regarded by physicians in charge of the insane is largely due to the prevalent belief that there is an etiological relation between Phthisis and Insanity. I am convinced, however, that unprejudiced observation will show that the prevalence of Tuberculosis in hospitals for the insane is due to the great facilities for infection and the lack of attention to the means of restricting the same. The A. P. H. A. has, by the report of its Committee on Restriction of Tuberculosis, pointed out the means of limiting the spread of this disease. By the adoption of these means the percentage of tuberculous deaths to

the general death rate in one hospital has been reduced in the course of three years from an average of 25 per cent. to a fraction under 9 per cent."

I was interested in this hospital report from Doctor Rohé, the Maryland hospital at Catonsville, and wrote to Doctor Wade, his successor, to learn the present condition of the tuberculous patients. He informs me that the death rate from Tuberculosis for 1896 was but 6.1 per cent. Doctor Wade describes the manner of caring for the tuberculous insane in this hospital as follows: "The sputa of the suspected case is examined, and if the bacilli are found the patient is placed in a single room, the walls of which are painted and can be easily disinfected. The furniture consists of an iron bedstead, which is readily cleaned. There are no curtains to the windows and no carpet upon the floor. The patient is persuaded, if possible, to expectorate into a vessel, which is disinfected with mercuric chloride. If the patient expectorates about the room no harm can be done, however, as everything can be readily washed with a disinfectant. The bedding is properly cared for and is used for no other bed. After the death of the patient the room and all of its contents are thoroughly disinfected."

It may be well to place Doctor Wade's opinion, relating to Tuberculosis among the insane, against the older views which I have already given. He states, as reasons for a high mortality from this disease in these hospitals—first, the fact that the physical condition of the insane patient is very much depleted on admission; second, the necessary confinement in the building; third, the difficulty of isolation; fourth, the lack of proper care and disinfection; fifth, the fact that many of the patients do not complain of their ailments and that the tuberculous process is well established before discovered.

Doctor Tomlinson, Superintendent of the State Hospital for the Insane at St. Peter, Minn., believes in the transmutation of Insanity and Phthisis. At the same time he believes that most of the cases of Tuberculosis in these hospitals originate by infection while in the hospital, and that patients having a direct heredity of Phthisis are not likely to die from this disease. In proof of this he quotes from the hospital's statistics as follows: "During a period of two and a half years, out of 695 patients admitted, seventy had a history of Phthisis in the family. Five patients were suffering from Phthisis when admitted. During this same

period, nineteen patients died of Phthisis, *and not one of these had an heredity of that disease.*

He believes that the materies morbi for tubercular infection is always present in the old style hospital, and that the poor hygienic surroundings, due to over-crowding, have much to do with its development. This is illustrated by the fact that at times a patient, who becomes infected with Tuberculosis and is rapidly failing, may improve when removed from these conditions, and apparently recover.

In concluding, let me offer the following propositions :

1. The old ideas relating to the interchangeable character of the phthisical and insane diatheses are not worthy of consideration when the question of isolation of the tuberculous in hospitals for the insane is under discussion.

2. The old ideas as to the close relationship between Tuberculosis and Insanity furnish the only excuse (and a very poor excuse it is) for the non-isolation of the tuberculous insane.

3. The insane should be classed as *irresponsible* invalids, and the course pursued by those who have them in charge should be regulated accordingly.

4. The insane may be more susceptible to the infection of Tuberculosis, for reasons already given, and, consequently, the means taken to prevent such infection should be most thorough.

5. The question of controlling the sane tuberculous may be a difficult one to settle, for the actions of the infected ones can not always be restricted. It is quite the reverse with the insane. Their manner of life is under control, and without any additional hardship to these unfortunates, the danger of spreading infection can be reduced to a minimum.

6. There can be no doubt but that most of the Tuberculosis in hospitals for the insane is the result of infection.

7. Over-crowding in these hospitals is one of the chief causes of the high mortality and the general infection from Tuberculosis.

8. Those who have charge of the insane ; governments, hospital trustees, and superintendents, are responsible for their care. Exposure to tuberculous infection, through carelessness or indifference on the part of such guardians, should be considered as criminal negligence.

DR. GARDNER SWARTS, Rhode Island : I most assuredly agree with the general conclusions of the reader of the paper. There is no question in my mind but that Tuber-

culosis is a communicable disease ; that it is not necessarily hereditary, but that it is a transmissible disease. Take the small State of Rhode Island, for example, and within its borders there are 950 deaths every year from Tuberculosis. It is not to be supposed that all of our ancestors were tuberculous, and that this great death rate is due solely to a hereditary cause.

We isolate many diseases in our public institutions ; for instance, Small-pox ; and yet, deaths from that disease can not compare in number with those resulting from Tuberculosis. I think this question of isolating tuberculous patients is a matter which should appeal very strongly to those who have charge of our insane asylums. It is well known that, generally, an insane person is reduced in health. There is a reduction of their alimentation and a decrease of their vitalities, therefore they are particularly susceptible to the presence of any communicable disease.

I feel very positively that it is our duty to isolate both the criminally insane who are tuberculous from their fellows, but also to isolate the tuberculous insane from other patients. In our insane asylum at —— the percentage of deaths was reduced from 33 per cent. to 9 per cent. by isolation of the tuberculous, and this certainly must be an argument in favor of isolation.

DR. BENJAMIN LEE, Philadelphia, Pa. : The subject is, "Should the tuberculous insane be isolated from other inmates in our asylums, and accommodations provided for them in separate and detached buildings?" I do not think there is doubt in the mind of any modern sanitarian that the tuberculous insane should be isolated from other inmates, but to provide separate and detached buildings for them is another thing.

With our knowledge of the manner in which Tuberculosis is propagated, and with the means at hand for the restriction of the contagion, we are able to kill the germs immediately upon their escape from the bodies of the patients. This being the case it is unnecessary to provide separate and detached buildings for the accommodation of such patients.

Most of our insane asylums, as they are at present constructed, consist of a central administration building, with a number of wings. It is quite possible to isolate the tuberculous insane in one of these wings without going to the expense of putting up separate and detached buildings.

There is no question in my mind that the tuberculous

insane should be isolated, but I fail to see the necessity of providing a separate building to accomplish this purpose,

DR. J. C. SCHRADER, Iowa: Mr. President and gentlemen, I would give it as my opinion that separate and detached buildings should be provided for the tuberculous insane. In that manner the spread of this disease among the inmates could be effectually controlled. If this will in any way, shape or manner help to prevent the spread of this disease, which is so prevalent in our country at the present time, and which seems to be increasing so rapidly, why we certainly should recommend to those in charge of our State institutions that this isolation should be made complete. We certainly should adopt every means within our power to prevent the spread of this terrible and infectious disease which is depopulating our country. We isolate cases of Small-pox, and yet the death rate from that disease is not to be compared with the high death rate resulting from Tuberculosis.

DR. J. N. HURTY, Indianapolis, Indiana: The question is whether or not the tuberculous insane should be cared for in separate and detached buildings. Why restrict this sanitary measure to the insane? Why not make it general and apply it to the tuberculous in all our public institutions, not restricting it to the insane asylums? It seems to me that there is much more danger of the propagation of the disease in our ordinary hospitals, than there is in our insane asylums. The isolation of the tuberculous should not be restricted to the insane asylums, but should be practiced in all our public institutions.

About two years ago, in Indiana, the State Board of Health recommended to the authorities of the State Prisons, the Insane Hospitals, the School for the Feeble-Minded, the Women's Prison, and the Reform School, that isolation be practiced in every case of Tuberculosis. At the last session of the legislature effort was made to provide for this isolation in the insane asylums and prisons, and during the past year complete isolation has been practiced. In the State Prisons, a prisoner who has Tuberculosis is not permitted to expectorate, and for that matter expectoration by any one is prohibited in any part of the prison, and even in the work rooms; for instance, in the melting room of the foundry, the prisoners are not permitted to expectorate even into the melting sand. The Northern Prison of Indiana, under the direction of the State Board of Health, has been completely renovated, on account of the immense

amount of Tuberculosis existing there. Every cell has been thoroughly scraped, the walls have been painted and the iron work painted. The prisoners, and especially those who have Tuberculosis, are compelled to practice the strictest hygienic measures. In the Insane Asylum we do not have separate buildings for the insane tuberculous, but they are kept in separate rooms, and are not permitted to mingle with the other patients.

DR. GARDNER T. SWARTS, Rhode Island: Is the restriction general, that is, is expectoration forbidden to all prisoners or only to the tuberculous?

DR. J. N. HURTY, Indianapolis, Indiana: Promiscuous spitting is entirely prohibited in the prison, in the yards, and in the work rooms. Expectorated matter from well or sick must be taken care of.

DR. C. A. RUGGLES, Stockton, California: I have been very much interested in the reading of the paper, and its sentiments appeal to me very strongly. I have been on the State Board of Health of California for ten years, and this matter has been prominent in my mind during this entire period. So far as California is concerned, its solution to-day is no nearer than it was ten years ago. I have studied along these lines and have tried to impress upon the proper authorities the necessity of segregation, so to speak, or isolation of the tuberculous from other inmates in our public institutions once a year. A short time ago I inspected the Home of the Feeble-Minded. Out of 420 children in that institution there were twenty-eight who gave unmistakable evidence of Tuberculosis, and yet they were permitted to mingle with the other children. I called the attention of the authorities to it, and I called the attention of the Governor to it, but thus far have been able to do little more than urge the necessity of isolating the tuberculous cases. We finally demanded the isolation of Tuberculosis in our public institutions. A bill was introduced in the legislature appropriating \$18,000 for this purpose; it was passed, but when it came to the Governor he vetoed it. What can be done to prevent the spread of Tuberculosis in California in the insane asylums, and we have five of them, if the State authorities and the Legislature will not provide the means? The percentage of mortality in our public institutions is perfectly frightful. Something is radically wrong. I am glad to see this question brought before this Conference, as it will tend to unify the action of the various State Boards of Health along this line.

I know of a woman who was afflicted with insanity, and whose physical condition was just as good as that of any woman in the world. She was confined in an insane asylum and died within ten years, of *Tuberculosis*. Why? There is no doubt in the world but that she contracted the disease by being brought into contact with tuberculous patients. This is a case with which I am personally acquainted, but how many times could this one case be multiplied if the real facts were known?

DR. W. H. SANDERS, Alabama: Mr. President and Gentlemen—The opening paper of this convention deals with a very important subject, but I think in the discussion that we have departed some distance from it, and that we have given it a wider range than was contemplated; but inasmuch as this departure has been made, I would like to ask the gentleman on my right (Dr. Hurty) whether he considers it wise to entirely prohibit expectoration by the tuberculous? The rule, as I understand his remarks, is now being enforced in the prison in his State.

DR. J. N. HURTY, Indianapolis, Indiana: Mr. President and Gentlemen—I would like to make a correction. I did not wish to say that there was no expectoration permitted, but that *indiscriminate* expectoration was not permitted. They are not permitted to spit on the floor, or in corners, but must use cuspidors, which are provided for this purpose, and kept in sanitary condition. Of course, the subsequent disposition of the sputum is arranged for.

2. PROPOSED BY THE STATE BOARD OF HEALTH OF COLORADO.

“WHAT MUNICIPAL ORDINANCE SHALL BOARD OF HEALTH ADVISE FOR RESTRICTION OF TUBERCULOSIS?”

DR. JAMES EVANS, Florence, S. C.: Although it is generally recognized that diseases of microbial origin require a specific microbe for its particular cause, there are other conditions requisite for the production of the phenomena, which we recognize as disease, and in regard to Phthisis it is not sufficient that the tubercle bacillus should find lodgment in the lungs or alimentary canal, of a man, but it is necessary that it finds there a soil favorable for its growth and multiplication before the fully developed disease can manifest itself. The indirect causes of *Tuberculosis* are far more important than the direct particular cause, inas-

much as they are chiefly concerned in lowering the vitality of the individual, rendering him more receptive to disease, and thus supplying every condition for the spread of the infection, and in the consideration of any plan for municipal prevention of this disease, the curtailment and suppression of these indirect causes must be assigned the most prominent place.

It will take many years of careful and painstaking education of the people, before we can venture to exercise any control of personal hygiene that will not be resisted as an unnecessary infringement and invasion of individual liberty. And as we can not hope to suppress the direct cause for want of co-operation of the citizens, we must endeavor to shield him from everything which tends to diminish his powers of resistance to this disease, as he is daily exposed to it.

Now the most prominent of these direct causes of Consumption are a damp soil, respiratory impurities, over-crowding, infected food; and municipal ordinances framed with a view of entirely preventing or reducing these evils to a minimum is the most practical way of accomplishing it.

The intimate connection between dampness of the soil and Phthisis death-rate has been established by the researches of Dr. _____ in this country, and Dr. Buchanan in England. It is an interesting and significant fact that the death-rate from all forms of the disease diminish as we recede from the Atlantic coast to the more elevated region in the interior of the continent, where it is at the minimum and increases again as we descend to the basin of the Great Lakes in the north, and somewhat less down the more gradual slope to the Gulf of Mexico in the south.

A marked difference in the progress and development of Phthisis in the dwellings not remote from each other has often been observed, and ascertained to depend on the relative dampness or dryness of the soil in which they are located.

In a number of the large cities of England the death-rate from Phthisis has diminished in many instances nearly 50 per cent. after the construction of a more perfect system of sewerage, which likewise contributed to more thorough drainage and greater dryness of the soil.

It is possible, and the day is not far distant, when all of our cities, even those situated on the sea coast, the great lakes and rivers, will, by the construction of an improved system of drainage, street pavements made impervious to

water, and the ground under dwellings covered with some material which will exclude moisture, be able to command as great exemption from this plague of the human race as is now enjoyed by the most elevated region.

Among the most potent causes influencing Tuberculosis is the unhygienic condition arising from defective ventilation.

The immunity from infection experienced usually by nurses in hospitals devoted exclusively to the care and treatment of Consumption, in which provision is made for the allotment of ample cubic space to each inmate, and the free admission of light, and good ventilation, is in striking contrast to the prevalence and fatality of this disease among sailors on board ships, soldiers in overcrowded barracks, and prisoners in small and ill-ventilated jails.

The greater prevalence of Phthisis in large cities is due to several factors, among which may be enumerated the great aggregation of population on a small area, frequent exposure to a more virulent form of the gerin in connection with other respiratory impurities. But the one which contributes most to the spread of the infection is the overcrowding in rooms, or the density of population in rooms.

This factor in the propagation of the disease is equally as potent for evil in the rural districts as in the cities.

Some years ago a colored man came under my care suffering with Tuberculosis of the lungs, who had been previously employed as a porter in a Pullman car, running between Washington and Jacksonville, Florida, and had doubtless contracted the disease while serving in that capacity. This man lived in a small room, had a wife and three children, who successively became infected with the disease, and in the course of two years the family became extinct. The susceptibility of the colored race to Phthisis, and its extreme fatality among them, has made a deep impression on every observant physician in the South, and the subject is invested with peculiar interest, as the excessive mortality has overtaken the race since emancipation, showing that the disease is more prevalent among them now than it was during the period of slavery.

In investigating this phase of the subject several years ago, I made inquiries among the rice planters, dwelling on the coast, who were the owners of much the larger number of slaves than elsewhere in South Carolina, as to the frequency and mortality of Consumption among their slaves.

The result of this inquiry was that Phthisis in any of its

forms was an exceedingly rare affection among negroes on the plantations. Many of these planters had no recollection of seeing a plantation slave affected with the disease, and it was even seldom seen among those who visited in the towns and cities where they were more exposed to the infection.

The negro engaged in the cultivation of rice is employed for a large part of his time during the winter months in repairing dykes and cleaning and digging ditches, and the consequent exposure in the performance of this work often gives rise to the acute forms of pneumonia and bronchitis. Yet they were singularly exempt from Consumption. The slave represented so much invested capital, and was warmly clad, well fed, comfortably housed, and when sick had the best medical attention. Consequently the mortality among them did not exceed that of the white man.

The death-rate in Charleston in 1860 of the negro was exactly that of the white man, 12 per 1,000. In 1895 it was 29.10 colored, 18.70 white per 1,000.

A comparison of the Phthisis death-rate in the city of Charleston among whites and colored in decimal periods from 1865 to 1895 inclusive reveals some startling facts.

The deaths from Consumption in the period from 1865 to 1895 were as follows :

In 1865—whites, 26 ; colored, 74.
“ 1875— “ 54 ; “ 132.
“ 1885— “ 57 ; “ 209.
“ 1895— “ 39 ; “ 194.

Total deaths in 31 years—whites, 1,525 ; colored, 4,975.

Estimated population in 1895—whites, 28,870 ; colored, 36,295.

The police regulations in force on most plantations did not permit the slaves to visit adjoining places without a permit, and they usually retired early at night and arose at an early hour next morning.

As soon as emancipation occurred, there was an exodus of the negro from the rural districts to the small towns and cities, where they congregated in large numbers, and there was overcrowding in every place that could afford the least shelter. And even now, on farms remote from the towns, they evince the same tendency of overcrowding their little cabins with more people than they can possibly accommodate with comfort or safety.

There is no disease which claims as many victims among

the negroes as Consumption. And the prime cause of this excessive mortality is room density ; too many living in the same room.

Dr. A. K. Chalmers, of Glasgow, has recently called attention to the relation of Phthisis death-rate to room density in the comparison of old and new Glasgow. The room density of the whole city fell from 2.040 in 1881 to 2.033 in 1891 (or a decrease of 7 persons per 1,000 rooms), and its Phthisis death-rate from 268 to 230 per 200,000 living. Nearly all districts having a death-rate above the mean had a room density above the mean.

Dr. Chalmers contends that the history of Consumption among masses of men so widely removed in their calling as soldiers, sailors and artisans, and having nothing in common but exposure to an atmosphere contaminated by the products of respiration in barracks, on shipboard and ill-ventilated work-rooms, affords sufficient evidence for regarding respiratory impurities alone as one of the most powerful of the conditions which contributes towards its prevalence. It may be pointed out, that among the instances mentioned there is common, also, the infective matter from previous cases of Consumption under conditions singularly favorable for the retention of its viability, as well as its distribution in the atmosphere.

This accounts for the immense mortality of Consumption in the ordinary lodging houses, and among a large number of those who visit and spend much of their leisure time, in these houses, and there is no doubt that the number of persons inhabiting a room, or room density, is a far better criterion of the density of population, than the number of persons living in a given area.

It is now very generally conceded, that a frequent source of infection of human beings with Tuberculosis is the consumption of milk from animals affected with this disease.

In all our cities and towns very lax rules and regulations are in force to prevent infection from this source. Some of our cities may enforce fairly stringent measures to secure a supply of pure milk from animals within their corporate limits, but hardly any of them take the precautions to insure the delivery from the country a supply equally as pure. Although cows are more subject to Tuberculosis in cities, yet by a rigid and strict examination of the animals and the application of the tuberculin test, an inspection at stated intervals, of the stables, the food and water supply, a pure supply can usually be obtained.

In an examination by the City Health Officer Dr. E. W. Hope, of Liverpool, on Tuberculosis, as affecting the milk supply of the city, 168 samples of milk were subjected to examination, and it was assumed that milk infected by this disease would be produced in guinea pigs when inoculated with it if the contamination was sufficient to be a source of danger to those consuming it as food.

Of 144 samples taken from sources within the city 2.8 were found tuberculous, while of twenty-four samples taken from cows at the railway station, 29.1 were found tuberculous. The inference drawn by Dr. Hope from these startling revelations is that the supply of milk from sources within the city, in regard to Tuberculosis, is far purer, and the cows inside the city are more healthy and under better conditions than those in the country. As to the causes in operation producing these striking results in the city of Liverpool, it was shown that the regulations in regard to the cow-sheds and houses in the city are very rigid in respect to the light, ventilation and cleanliness of them, and that the whole time of two competent inspectors is taken up in visiting these places and seeing that the law in regard to them is rigidly enforced. In addition to this, the health of the cows is looked after by five other inspectors, who spend their whole time in seeing that every animal is free from disease, and especially Tuberculosis.

The cow-keepers in a city where such rigid laws and rules are enforced are particularly interested in buying healthy animals, and knowing the greater susceptibility to this disease in city than country, do not keep them more than a year before being sent to the slaughter-pen and afterward replaced by cows from the country, where they are especially selected for their healthy condition. A city which adopts such stringent measures to obtain a pure milk supply within her borders is very apt to take some steps to obtain a pure supply from the outside. The proportion of infective milks at the railway station is an astonishing revelation, and if the same state of affairs exists in other cities it becomes a question of urgency to deal with the farms in the country. Indeed it is extremely problematical if any adequate provision is made by our large cities by inspection or otherwise to guard against this method of the spread of the infection, and before our cities can effect much in the way of protection of the people from this dreadful disease they must make the attempt, at least,

by ordinance, to subject milk from the country to rigid inspection and control.

It is evident, then, that an inquiry of this nature, instituted in all of our cities, is a fit prelude to the work of practical administrative prevention of Phthisis in them, and when it is inaugurated the results in the future on the death-rate of Phthisis will be looked for with a great deal of interest.

PROF. W. H. BREWER, New Haven, Conn.: Mr. President and Gentlemen—Before saying anything with reference to the paper which has just been read, I wish to state that I do not desire to sail under false colors. I am not a doctor, although for twenty-five years I have been on health boards, and am at present the President of the Connecticut State Board of Health.

The subject is, "What municipal ordinance shall State Boards of Health advise?" This is certainly one of the duties of the State Board of Health, to advise municipalities in regard to the proper ordinance to pass for the restriction of certain diseases. Shall the State Board of Health advise the passing of an ideal ordinance, which, undoubtedly, if it could be enforced, would be the best thing for the community; or an ordinance that it is possible to carry out; an ordinance that would have public sentiment back of it? I say to you right here, gentlemen, if an ordinance does not have public sentiment back of it, it will be a dead letter.

I think one of the chief duties of the State Boards of Health is an educational one. We must educate the people. We must arouse public sentiment in favor of sanitary reforms, and then proper ordinances may be passed and enforced.

It is easy to enforce a law when you have the people back of it. I can give you a little illustration of this, which occurred in New Haven. I labored on the Board of Health of that city for seventeen years, and was President of it for twelve years. Among the matters which came before us was an open sewer, which formerly had been a brook, and which ran right through the city. That brook, or sewer, had been a nuisance from the very settlement of the place. Something like one hundred years ago, it was said to have been the cause of an outbreak of Yellow Fever. Administration after administration had tried to have that nuisance abated, but without avail. It had cost several political lives. The Board of Health took hold and insisted that an

ordinance should be passed abolishing that nuisance. You could have abolished the State Board of Health easier! But in the light of later sanitary science, when the people were educated up to the point that they could appreciate the dangers of it, it was easy enough to pass an ordinance to abolish that nuisance, and to enforce the law. To come back to the original question, it seems to me, that ordinances should be recommended to suit the special necessities of the various localities. Cities and towns vary so much, and in so many different ways, that it would not be proper to recommend uniform laws, governing all alike. For instance, one city has a large tenement population, and another has none. It would, therefore, seem advisable that the City or Town Boards of Health, rather than the State Boards of Health, should frame the municipal ordinances, acting perhaps under the guidance and advisement of the State Board of Health. If the local health officials are not competent to consider the special needs of the different cities, they are not fit to be health officials.

Among the many questions which are now coming before Boards of Health is the question of milk. How can the purity of the milk supply be regulated by a municipal ordinance? Take New York City for example; it derives its milk supply from at least four states. The three states which furnish the largest quantities are New York state, New Jersey, and Connecticut. The milk is often transported a distance of three hundred miles before it reaches the consumer. Now what authority can the legislature of New York, or the municipal authorities of the city of New York, exert over this milk supply? How can the local New York City authorities inspect stables three hundred miles away in another state? If the legislature passed such a law, could it be enforced? I question it very much indeed. Public sentiment is not as yet strong enough. We can only accomplish desired reforms when we have the community at our backs; therefore we must keep pushing them until they realize that state and local Boards of Health are working for the benefit of, and deserve the support of, the community at large. This must be accomplished gradually, and the work will only be hindered by attempting too much at once.

DR. C. B. JOHNSON, Champaign, Illinois: I was very much interested in the statement made regarding the colored race. That is, the immunity they formerly enjoyed from Consumption and their extreme susceptibility to this

disease to-day. The same thing is true of the American Indian. Dr. Rush, in his *Medical Enquiries*, published about one hundred years ago, speaks of the Indian as being absolutely free from Consumption ; to-day, I am informed, that Tuberculosis is one of the scourges of the Indian reservations. This certainly goes to prove that Consumption is contagious ; indeed, to my mind, it is a demonstration of the fact.

I think one of the first and most important things to do in this matter of the prevention of the spread of Tuberculosis is to educate the physician himself. There are many, many physicians to-day who do not know, or at least do not seem to realize, that Consumption is a dangerously contagious disease. First educate the physician, then their patients, and finally the people generally.

DR. R. H. LEWIS, Raleigh, N. C. : I think that the Board of Health should be very cautious in recommending municipal ordinances. Of course, we could frame ordinances which would practically control the spread of Tuberculosis, and lessen many other evils. We could draft an ideal ordinance, but this ideal ordinance to which public opinion has not been educated, would not only prove ridiculous in the eyes of many, but greatly lessen the influence of the Board of Health.

Two or three years ago the Governor of our State received a circular letter asking his opinion as to whether health laws should be made compulsory ; that is, whether he believed in the educational method or the compulsory method. He gave me that letter to answer. I answered that I believed in both the compulsory method of treating health questions as well as in the educational method. Compulsory laws are all right, if the authorities do not go too far in trying to enforce them. In North Carolina it is simply impossible to enforce sanitary regulations up to which the people are not educated. In larger cities, where there are thoroughly organized Health Boards and an efficient police force, it might be possible to enforce obnoxious laws—until the next election !

In regard to the negro question, it is undoubtedly true that Consumption is now the scourge of the negro race, but it has become so only since emancipation. It was not so during slavery times. It commenced shortly after the emancipation of the negro race, and has been increasing very rapidly ever since. It has been stated by some one that unless something is done to prevent the spread of

Consumption among the negroes, the so-called negro-question will soon be very effectually settled by the extermination of the colored race.

DR. GARDNER T. SWARTS, Providence, R. I.: So far as ordinances are concerned, the proof of the pudding is in the eating. The New York Board of Health has been a pioneer in many ways in making ordinances intended to control and prevent promiscuous expectoration, and also for the control of contagious diseases in general. It has recently caused the passage of the ordinance requiring physicians to give proper notice of all cases of Consumption which come under their observation in the same manner as cases of Small-pox, Diphtheria, Typhoid Fever and other contagious diseases. Of the three or more medical societies in that city two at least have confirmed resolutions condemning the action of the State Board of Health in proposing this ordinance, declaring it to be uncalled for. The time may come when such ordinances may not only be passed and enforced, but the time is not at hand. Another ordinance looking to the regulation of expectoration in public places is receiving considerable opposition. Two persons have been arrested for violating the law, and the cases have been decided in favor of the State Board of Health.

In framing such an ordinance the local officers should always specify that no one shall expectorate in tram cars or public conveyances.

Of course these two arrests in New York City are not of so much value in the way of punishing individuals as in bringing these matters before the public. These influences are largely matters of education. If we have to educate the public, energetic methods should at once be begun and carried out, until sanitary ordinances may not only be passed but enforced.

DR. BENJAMIN LEE, Philadelphia, Pa.: I would ask Dr. Ruggles if he can give us any information regarding the case of W. B. Bradberry, of San Francisco, who was recently arrested for spitting in a street-car—for "salivary defilement of a street-car," as the reporter calls it. I have here his picture, in a cutting from a newspaper, and would ask our President if the history, as given in this clipping, describes an actual occurrence.

DR. C. A. RUGGLES, Stockton, Cal.: The cities of San Francisco, Stockton and Sacramento have laws prohibiting spitting in public conveyances or on the sidewalks, and

these laws are enforced. This man Bradberry objected to the operation of the law in San Francisco. He had more money than sense and willfully violated the law by spitting on the floor of the street-car in the face of polite requests of the conductor to desist from so doing. He was arrested for the offense and found guilty. I believe he has been arrested twice.

I wish you could have seen the difference in the streets of Stockton thirty days before the law went into effect and thirty days after. The streets now are, so far as this nuisance is concerned, as clean as could be desired. A stranger returning to Stockton, after an absence of several years, would scarcely recognize the streets of that city.

Public sentiment is with us in this matter, and that is the reason the ordinance has received such hearty support.

DR. BENJAMIN LEE, Philadelphia, Pa.: It occurs to me that this case might illustrate very well the difference between education by means of literature and education by means of law—by means of enforcement of law. I believe enforcement of law in this case did more to educate the people in California than could have been accomplished in years by the dissemination of literature dealing with the dangers of expectoration.

W. H. BREWER, New Haven, Conn.: The attempt to enforce a law for the suppression of Tuberculosis in cattle, and which cost our state \$50,000 to \$60,000 a year, raised such a heavy storm of opposition that the law was abolished at the last session of the legislature.

DR. JAMES F. McSHANE, Baltimore, Md.: I think the educational method the proper one, and this educational method can be largely aided by proper ordinances. I think one of the best plans for the restriction of Tuberculosis is the registration plan; that is, registration by attending physicians of every tuberculous patient in the same manner as all other cases of infectious diseases are registered. This is being done in Baltimore, and I believe this ordinance has done very much to educate, not only the tuberculous individual himself, but all his friends, and it has done more than could have been accomplished in any other way.

DR. JAMES EVANS, Florence, S. C.: There is no doubt but that the regulation of milk inspection, where the milk is transported through several states, is a very difficult matter; it is something like the operation of the law in my own State regarding the sale of liquor, and then we would

have the original package question to deal with, the inter-state commerce question, etc. So far as different states are concerned but little can be accomplished until uniform laws are passed to control the production and shipment of milk.

DR. FELIX FORMENTO, New Orleans, La.: I think a little too much stress has been laid upon the necessity of having public sentiment back of a law. I think the State Boards of Health should formulate laws which will educate the public. We ought not to wait until the public is educated, but we should educate it. In my own city and State a number of ordinances and laws have been passed, which were received with much opposition; but soon after the enforcement of the laws these very persons who first opposed it acquiesced and obeyed. We have a law for the inspection of all the milk introduced in the city of New Orleans, whether it comes from the immediate neighborhood or from a distance. It must come up to a certain standard or it is rejected.

The public should be led to follow sanitary guidance or sanitary law, but we should not wait to be led by public opinion.

DR. FELIX FORMENTO, New Orleans, La.: Mr. President, I offer the following resolution:

Resolved, That it is the sense of this Conference that tuberculous patients should be isolated from other inmates in our hospitals, asylums, prisons and penitentiaries.

Upon motion, properly seconded, resolution was adopted.

PRESIDENT C. A. RUGGLES, California: Dr. Henry B. Baker, of Michigan, desires an opportunity to invite the Conference to meet at Detroit next July. I do not wish to interfere with the action of the Executive Committee, which has the power to appoint a time and place of meeting, but I simply call your attention to Dr. Baker's invitation.

“WHAT ATTITUDE ARE STATE BOARDS OF HEALTH PREPARED TO TAKE REGARDING THE NEW LAW FOR GENERAL INSPECTION OF DAIRY CATTLE, AND WHAT ARE THE DETAILS OF ANY PRACTICAL SCHEME FOR INSPECTING ?”

- (a) “Herds Supplying Public Milk?”
- (b) “Dairy Produce?”
- (c) “For Dealing with Animals which React to the Tuberculin Test?”

Discussion opened by Benjamin Lee, M. D., of Pennsylvania.

The selection of the representative of Pennsylvania as the member to open the discussion on this very important topic was, from one point of view at least, an unfortunate one. The Legislature of that State has placed the entire subject of the sanitary supervision of cattle and dairy produce in the hands of the Department of Agriculture.

A sub-department entitled “The Sanitary Live Stock Board,” has been created, the chief of which is the State Veterinarian. While intimate relations exist between that body and the State Board of Health, and they work in harmony at all points where the diseases of domestic animals directly or indirectly affect the health of human beings, yet the knowledge that another official bureau is devoting itself entirely to the suppression of disease in the bovine race, naturally has the effect to lead the Board of Health to throw the responsibility of the supervision of dairies and dairy cattle upon those to whom this duty was specifically assigned, and to devote its energies to other subjects more particularly its own. Of course no amount of legislation can entirely relieve it of a sense of duty in this regard, but what it does is in the shape of a suggestion rather than of executive action.

Of the necessity for official inspection by state authority of all dairies and all milch-cows, whether supplying public milk or supplying simply their owners, I, for one, am thoroughly convinced.

The latter class, of course, do not present the same pressing need for governmental supervision that the former do, but as soon as we admit the principle that bovine Tuberculosis is contagious from animal to animal, and that its germ is essentially the same as that of Tuberculosis in the human family, we must accept the necessity for leaving no

possible focus of this disease without investigation and supervision.

As regards public dairies, there is room for doubt whether the communities which receive the supply should not be left to protect themselves, and whether the most efficient work of the State Board does not consist in stimulating the local Boards to a full sense of their duties in this particular, and furnishing them concise and well digested information as to their powers and the best methods of exercising them, as well as the real character of the dangers resulting from their neglect.

Even without the specific legislation, I believe the general police powers of a municipality extend to the protection of the health of its people, by the inspection of the sources of its milk supply. The health officer of one of our small cities in Pennsylvania has taken the cow by the horns and instituted a system of personal inspection of every dairy from which milk is brought to that place. He makes the inspection a prerequisite to the right to sell milk to the citizens. After each inspection he publishes a report in the daily papers in detail and rates the dairies, in accordance with the care bestowed by the owners, both on the animals and on their habitations. While this was at first objected to by the farmers, they now all acquiesce in it, and the improvement in the condition of the stables and yards, and appearance of the animals, has been very marked. In my mind, nothing will take the place of inspection of the dairies. I feel it to be at least of equal importance with the employment of the tuberculin test.

The practical details for such inspections have been carefully considered and fairly well formulated by the State Live Stock Sanitary Commission of Pennsylvania, already referred to.

They comprise first, an inspection of the premises, made by a veterinary surgeon appointed for the purpose. This inspection has reference to the following particulars :

(EXHIBIT A.)

General plan of stable.....

Dimensions.....

Air space, cubic feet per animal.....

Method of ventilating.....

Method of lighting.....

(Location and size of windows.)

Floor (Material and grade.)
 Gutters
 Fastenings for cows
 Style of manger
 General condition of stable (Clean or dirty.)
 Dimensions of yards
 Drainage of yards
 Condition of yards
 Method of watering cows
 Source of water (Well, spring, stream, location, etc.) (Stored in tank?)
 Character of water (Temperature, odor, taste, cleanliness.)
 General remarks
 Location and character of milk room or house

Second. An inspection of each animal with the employment of the tuberculin test. This includes the following points :

(EXHIBIT B.)

Description (Sex.)	(Breed.)	(Age.)	(Herd book number.)
(Marking.)			(Tag number.)
History Physical condition Preparation of tuberculin Time of injection M.			
			189 .

TEMPERATURES *before* INJECTION.

Date 1 A. M.		1 P. M.	
2 "		2 "	
3 "		3 "	
4 "		4 "	
5 "		5 "	
6 A. M.		6 P. M.	
7 "		7 "	
8 "		8 "	
9 "		9 "	
10 "		10 "	
11 "		11 "	
12 N.		12 M.	

TEMPERATURES *after* INJECTION.

Date 1 A. M.		1 P. M.	
2 "		2 "	
3 "		3 "	
4 "		4 "	
5 "		5 "	
6 A. M.		6 P. M.	
7 "		7 "	
8 "		8 "	
9 "		9 "	
10 "		10 "	
11 "		11 "	
12 N.		12 M.	

The results of the tuberculin test are recorded on a separate sheet for each animal, and those for the entire herd on another sheet, a copy of which is herewith presented :

(EXHIBIT C.)

NUMBER OF ANIMAL.	BREED.	Age.	TEMPERATURES BEFORE INJECTION.				DATE.
			Date.....	Time.	Time.	Time.	
TEMPERATURES AFTER INJECTION.							
Date.....				REMARKS.		
	Time.	Time.	Time.	Time.	Time.	Time.	Time.

The State Veterinarian has authority to order any animal to be killed on the written certificate of the Veterinary Surgeon that he believes it to be tuberculous.

An agreement is entered into in writing between the owner of the animal or his agent and an agent or member of the board appraising the same, due consideration having been given to its actual value and condition at the time of the appraisement.

A careful autopsy is made of every animal slaughtered,

and when the results admit of the slightest doubt, a bacteriological examination is also added. The blank for the autopsy is herewith appended.

(EXHIBIT D.)

Animal	Spleen
How killed	Liver
Breed	Portal Lymphatic Glands
Age	Uterus
Markings	Kidneys
Condition	Diaphragm
Skin	Pleura
Lymphatic Glands of Flank	Right Lung, surface
Udder	" section
Lymphatic Glands of Udder	Left Lung, surface
Lymphatic Glands of Shoulder	" section
Peritoneum	Mediastinal Lymphatic Glands
Stomach	Bronchial Lymphatic Glands
Small Intestine	Pericardium
Large Intestine	Postpharyngeal Lymphatic Glands
Mesenteric Lymphatic Glands	

To sum up I would say :

First. That the State Boards of Health should insist on the inspection by competent veterinarians or health officers of all cattle used for dairy purposes, and the premises, yards and stables in which such animals are kept.

Secondly. They should insist on the use of the tuberculin test.

Thirdly. Animals which react to the tuberculin test should be legally appraised and slaughtered. Such portions of their flesh as are evidently free from infection may be used for food under careful restrictions.

3. PROPOSED BY THE PROVINCIAL BOARD OF HEALTH OF ONTARIO.

"WHAT ATTITUDE ARE STATE BOARDS OF HEALTH PREPARED TO TAKE REGARDING THE NEW LAW FOR GENERAL INSPECTION OF DAIRY CATTLE, AND WHAT ARE THE DETAILS OF ANY PRACTICAL SCHEME FOR INSPECTING ?"

- (a) "Herds Supplying Public Milk ?"
- (b) "Dairy Produce ?"
- (c) "For Dealing with Animals which React to the Tuberculin Test ?"

DR. J. C. SHRADER, Iowa: To me has been assigned the pleasant duty, by our esteemed Secretary, Dr. C. O. Probst, in connection with my learned and well versed

Sanitarian, Dr. Benjamin Lee, of Pennsylvania, of opening the discussion of the questions submitted by the Provincial Board of Health of Ontario.

The question resolves itself into two parts or sections.

First. What attitude are State Boards of Health prepared to take regarding the need for general inspection of all dairy cattle?

This very important subject has been the theme for discussion among many of the members of the different State Boards of Health, as evidenced by the reports of these Boards; not only have the members of the State Boards, but sanitarians in general, viewing the great importance of the subject and its direct relations to the public health, become alive to the very great importance of the subject and are asking this question: Do we need a careful and rigid inspection of our dairy herds? Were there no danger arising from the neglect of this inspection, then the cause for this wide-spread alarm is needless. But what are the facts in the case?

It is undoubtedly true that many of the cows, kept for supplying milk to the people, are diseased. But this has been so often demonstrated in the past few years, that it is not necessary to spend time in the attempt to prove it. But the question remains: What are we as State Boards prepared to do?

The interests involved are so vast, and the adoption of wise and efficient measures so important, that the subject should receive the fullest discussion, with all the available facts before us. The scientific aspect of the question has made more uniform progress than the practical application of the facts discovered to the eradication of the disease.

Within the past few years there has been a general awakening to the vital importance of this question all through the scientific world. But the question at issue is: What can State Boards of Health do to further the great cause for the protection of the people?

In our own state the most that our Board can do is in an advisory way. They, or even our State Veterinary Surgeon, can not order the destruction of our dairy cattle. They can quarantine the herds, and can recommend their destruction, and can urge the people not to buy the milk from diseased animals. There is no doubt that as soon as the people are aware of the great danger to themselves and their families they will refuse to buy the milk, butter or cheese from these infected herds, or at least from those

animals that have been found to be diseased from the tuberculin test.

That is now agreed to be a sure test of the existence of Tuberculosis among cattle.

The people should immediately be informed of the great danger of contracting tubercular Consumption. They should also be informed of the vast number of deaths from Consumption, and this will continue to be the case as long as diseased milk and meat are allowed to be sold for food, and not only will it continue but will increase rapidly. But if you say to the people through some recognized authority (such as bulletins published by and with the authority of the State Boards), and they become awakened to the fact of their danger, then the work of the Boards will be lightened. The people will demand the enactment of wise and stringent laws by their several legislatures for the control of the traffic in diseased milk and meat. Authority will then be given to either a commission created for that purpose, as now exists in some states, or the Boards of Health already in existence, having power to not only control the traffic but to destroy the animals. In our state we do not have the authority to destroy the diseased animals without the consent of the owners.

There is in connection with this subject another important matter to be settled: What remuneration shall be made to the owners of these diseased herds, and if it is agreed to pay the owners a certain sum, how much of the real cash value of the animal shall be paid, and where shall the money come from?

From the counties where these herds exist, or from the State at large, as this is for the protection of the general public, it would seem that all the people should bear their proper proportion of the burden. These are questions that should be carefully considered by our law-makers.

In a great state like Iowa one inspector is not sufficient to properly attend to the inspection, but our State Veterinary Surgeon should be supplied with a suitable number of deputies, who should get their instruction from him and should be required to report to him the number of cattle found diseased, and what recommendation had been given the owners of these diseased animals, and many had been destroyed, and the remuneration paid the several owners.

Another very important matter to be considered is what disposition shall be made of the carcass. It is very evi-

dent that the carcass should not be fed to hogs for fear of the disease being communicated to them and through them to the people. That this is one source of conveying Tuberculosis to the human family, no one should deny. But, as the subject has received but very little attention, the people are not aware of their danger.

I know of no better way of informing the people than by short, brief, but pointed circulars, issued by the different State Boards for distribution among the people similar in character to those issued now in relation to Small-pox, Scarlet Fever, etc. By scattering these broadcast, they would do a vast amount of good. For, when the people are once informed, your work is easy and the State Inspector would be hailed with delight with his little vial of tuberculin, thermometer and hypodermic syringe. These are his instruments of precision; though few in number, they are ample, and their very simplicity adds to their value.

Let each State Board of Health and Sanitary Convention pass resolutions commanding the inspection of all dairy herds and call upon the law-making power in each state and province to pass rigid and comprehensive laws for the protection of the people.

If this plan is adopted it will not be long until the executive of each state will embody these resolutions in his recommendations to the several legislatures for their enactment into laws. As our law-makers are not well versed in these matters, it would be wise if the legislative committee of each board would formulate such a bill and see to it that it was brought before each chamber for adoption.

There is one other point that I would press upon the attention of not only this meeting, but of the state and provincial boards; and that is the standing by the recommendations of the State Veterinary Surgeon or of the committee that has this matter in charge. It would give his or their acts a semi-official character, at least, and his or their orders and directions to the people would be received with much greater force.

These few and simple suggestions should be carried out as faithfully as possible, for it can not be done all at once; it will require but a few years to see them adopted and enforced. One of the early results would be that when a herd, or parts thereof, were offered for sale, the first question would be, have these cattle been inspected? If so, produce the certificate of health; if not, the breeder or

dairyman, as the case may be, will be compelled to have them inspected before offering them for sale. Then we will begin to see some of the fruits of our efforts to encourage the keeping of only healthy animals for the dairy. I have dwelt but lightly upon the causes that render the inspection of the dairy cattle so important.

As you are all so familiar with the results of using diseased dairy products, I thought best to devote my brief time in opening this discussion to the best methods of combatting the evil results to the consumer.

Second. The details for a practical scheme for inspecting herds. This has been incidentally alluded to in the remarks already made, but it may be insisted that no regular plan is outlined for the faithful inspection of the herds of dairy cattle. To my mind, there seem but two feasible schemes for carrying this out.

First, this should be done by the State Inspector, or, as in our State, by the State Veterinary Surgeon and his deputies, ample authority having been given by legal enactment for this purpose; or, second, by the appointment of a commission, as in the States of New York and Massachusetts, who have ample power not only to inspect the dairy herds, but all other cattle, and also the authority of condemnation and their destruction.

The question arises, which is the wiser of the two plans? It strikes me that there would be less machinery and perhaps less friction should this authority be given the State Veterinary Surgeon. The Legislature should pass a law, stating the prices to be paid for certain classes or breeds of cattle, and the quality as well as the age of the animal should be taken into account, with carefully prepared rules for this inspection and condemnation, say by the State Board of Health, and have these submitted to some authority, such as the Attorney-General or the Chief Executive, or to the Executive Council. These rules should be so just in their application that justice would be done to all.

I am informed that the commission system has worked well, but is too slow in its action. The three commissioners having to act in concert, it takes too long a time to cover a great state, where, in the other case, there could be a deputy in each county and he would report direct to his chief. Of course, there should be some method adopted of taking an appeal where the owner of the cattle felt aggrieved.

Can infected milk be sterilized or rendered fit for human

food? This question has lately been discussed by V. A. Moore, U. S. Department Agriculture, report of 1895. In the year book he discusses in a general way, milk, butter and cheese, as carriers of infectious diseases, sources of milk contamination, pasteurization and sterilization, and describes several experiments on the extent which disease germs are separated from milk, by running it through a separator. In these experiments, milk was used which was artificially infected with pure culture of the various disease germs, these being suspended in water and mixed with the milk. After performing numerous experiments, he shows conclusively that this method is not reliable, and recommends the pasteurization of milk intended for butter making.

Are there other methods that are cheap and reliable by which the milk from infected animals can be rendered fit for food? Mr. Bay, Bacteriologist to the State Board of Health of Iowa, says: As regards the conveyance of infection through milk, the broad fact was hitherto established that a tuberculous cow may give tuberculous milk, and will do so if the udder is affected. It has been proved, beyond any doubt, whatever, that the bacillus of Tuberculosis may be found in milk, even when the animal has not been attacked by Tuberculosis of the udder, and when tubercular lesions are not generalized. The facts proving such conclusions are very instructive.

Dr. Schroeder, of the U. S. Bureau of Animal Industry, reports that in 19 specimens of milk collected in Washington, D. C., one contained quite a large number of bacilli, and he concludes his report by expressing the opinion that, now and then, the presumably mixed milk dairies may contain enough tubercle bacilli to affect the human system.

Prof. O. Ballinger, of Munich, has shown that Tuberculosis can be produced by the use of diseased milk. This and much more evidence of this kind has caused these rules to be proposed for adoption.

First. Milk from cows affected by Tuberculosis, in any part of the body, may contain the bacilli.

Second. There must not necessarily be a lesion of the udder before the milk can be contaminated.

Dr. Roth, of Switzerland, claims that the tubercle bacilli found in the milk may also be found in the butter prepared therefrom. When the tuberculous butter was inoculated into the abdominal cavity of guinea pigs, the latter very soon died from the violent attacks of Tuberculosis. Thus

it seems that the ripening, churning and salting of the butter did not impair the life, activity and faculty of propagation in the bacteria.

It appears as if the numerous cases of Consumption in the human beings, infants, as well as adults, can now be better accounted for than before.

We err very little when surmising that quite a considerable number of cases occur as a result of tubercular milk, butter and cheese. The danger of infection is great; but, as yet, we have no cheap and reliable methods of sterilization that we can recommend for rendering diseased milk fit for human food. The great question recurs: What shall be done with the animals that react to the tuberculin test?

As we have thus far failed to find a remedy for the disease, either in the human family or in infected animals, it would seem that prevention is about the only means we have that is certain in its effects. This great subject should be viewed from two aspects: First, that of its deleterious effects upon the human family; and second, its commercial importance.

First. Do we use proper care in keeping our cattle free from disease? We must all admit that this is most shamefully neglected. A large part of the milk that is sold, and especially that made into butter and cheese, is produced by the small farmer; and, before we can have pure milk and its products, these farmers and dairymen must be educated in regard to cleanliness of himself, the cows, and the barns or stables where they are kept. The utensils, buckets, milk pans, must be properly sterilized before the milk is placed in them. The dairyman or milker should have his hands clean. He should not be infected himself with Tuberculosis; if so, he will most surely contaminate the milk.

Thus you see the necessity of his being properly educated. The udder of the cow should be cleansed before milking, and the cow should be fed on good, healthy food, to insure healthy milk. The barn should be well ventilated, and then, with all these precautions, the cow should be subjected to the tuberculin test; and, if infected, should at once be condemned and separated from the rest of the herd until some lawful disposition can be made thereof.

In order to impress upon your minds the magnitude of the dairy industry, I will state that in one of the western counties of Iowa, 3,000 pounds of butter is made daily, for export. This is shipped direct to Liverpool, England. This is but one creamery in one county, and there are

100 counties in the State. Iowa manufactured and sold outside the State in 1896, 80,052,916 pounds of butter; besides the large quantities made and consumed in the State. When we view this vast industry, and consider how much of the food of the people is derived from the product of the dairy in milk, butter and cheese, we at once see how necessary that the product should be healthy.

And now, Mr. President and Gentlemen, I have attempted to call your attention to the importance of this subject; first, from a sanitary standpoint, showing in a brief manner the danger of using diseased milk and its products; and second, by its great commercial importance, "The might of necessity can not be resisted." All of which is respectfully submitted.

W. H. BREWER, Connecticut: We have it stated very specifically what we ought to have done, and I don't think anybody for one moment would dispute the sanitary soundness of any of the recommendations which have been made. I would like to ask, however, if there is any state treasury in any of our Northern States which has sufficient money to pay the expenses of carrying out these recommendations. I know several states which are endeavoring to handle this question, and although they have hardly made a commencement they are already groaning very heavily indeed. Even in the inspection of milk it requires a great deal of money to do it thoroughly and properly. The thoroughness with which it can be done depends almost entirely upon the size of the appropriations. When you go back of the inspection of the milk to the inspection of the herds the expenses increase greatly; and when you come to the question of what shall be done with animals that react to the tuberculin test, the expenses are still heavier. It is a question of expense and state appropriation.

DR. H. M. BRACKEN, Minneapolis, Minn.: I am very much interested in this subject. It so happens that the State Board of Health of Minnesota differs from many of the other State Boards in matters pertaining to bacteriological work. I believe with Dr. Lee, that the labors of the State Boards should be largely educational, and that the work of caring for these dairy products, looking after dairy herds, etc., should be done by the Local Boards. The State Board should stand back of the Local Boards with advice and support.

In Minnesota, the State Board of Health and the Local Boards of Health have power to quarantine and control

animals suffering from an infectious disease. It has also power to condemn and cause to be killed any animals suffering from an infectious disease. It does not pay for animals so condemned and killed, and I see no reason why it should.

If the Board should start out to pay for every horse killed because of Glanders, every cow killed because of Tuberculosis, every hog killed because of Cholera, etc., the State would soon be in bankruptcy. Not only so, but the tendency would be to make the farmers careless. We should educate the farmers to understand that it is to their own interests to eliminate unhealthy stock. This is what we are trying to do in Minnesota.

Among the members of our State Board is a Veterinarian. He has been made Director of the Veterinary Department of the board. His work is, and should be, in connection with the general interests of sanitation, and this can best be carried on through the State Board of Health. It seems to me a mistake to multiply commissioners. All matters pertaining to sanitation should be kept under the control of the State Board of Health as far as possible.

The Minnesota State Board encourages the inspection of dairy herds and gives such help as lies within its power. Now, as regards the milk supply. It has been stated that a city can not reach beyond its own limits in controlling its milk supply. This is a mistake, as demonstrated by Minneapolis. This city has an ordinance through which it prevents the sale of milk within its borders, unless such milk can be shown to have come from an inspected dairy. It can not compel a dairyman outside of the city limits to have his cows tested for Tuberculosis, but it can prohibit the sale of milk within the city until it can be shown that the milk is from an inspected herd of cattle. The inspection of cows within the city limits is carried on under the supervision of the City Board of Health. This board is giving all the assistance in its power to dairymen in their efforts to eliminate Tuberculosis from their herds. Thus you will see that Minneapolis is in a fair way to secure a good milk supply.

Another important question for consideration is what shall be done to control the sale of meat from tuberculous animals. There is but one answer to this question. All such animals should be killed under inspection, and the inspector should determine whether any meat from such

condemned animals is fit for food, or whether it all shall be turned to the rendering tank.

DR. GARDNER T. SWARTS, Providence, R. I.: In our state payment is made for animals killed by the order of the State Board of Health; one-half of the value of the animal if it is found to have been diseased, and full value if a healthy animal has been killed. The State of Rhode Island has been considerably imposed upon by having diseased animals run over into its borders. Outside of the state a diseased animal is worthless, but the moment it crosses the boundary line into our State it becomes a valuable animal. But steps are being taken to stop this practice.

It should not be forgotten that the product of the cow, of even healthy cows, has a powerful influence upon the vital statistics. Leaving the question of Tuberculosis entirely out, the condition of milk should receive much more attention than it does. More children die of diarrheal diseases caused by drinking impure milk than die from Tuberculosis caused by drinking infected milk, therefore inspection of the milk itself should be very rigid. Not only that, but its care from the cow to the consumer should be regulated. As to how far this supervision can and should be carried, is a matter of local conditions. Milk dealers might be furnished with certificates which state that their milk is obtained from animals which have been tested with the tuberculin test. It might also state that the cows are pastured in meadows free from noxious weeds; that they are kept in perfectly clean stables; that the hands of the milkers and the udders of the cows are washed before milking the cows. The milk should be taken into sterilized cans, sterilization of which has been accomplished by a heat of 100 degrees centigrade for twenty minutes. The milk should be strained through sterilized cloth, and then the milk itself should be cooled by cistern water, to remove the animal heat, down to forty-five centigrade, and kept there until delivered to the customer. This method of handling the milk certainly decreases the chances of carrying disease and death to children. Such plan of operation could and should be carried out in every dairy in the country.

4. PROPOSED BY THE STATE BOARD OF HEALTH OF WISCONSIN:

"TO WHAT EXTENT, IF ANY, SHOULD THE STATE BOARDS OF HEALTH BE EXPECTED TO FURNISH DIAGNOSIS OF CONTAGIOUS AND INFECTIOUS DISEASES WITHIN THEIR RESPECTIVE JURISDICTIONS?"

Discussion opened by Professor Wm. H. Brewer, President of the State Board of Health of Connecticut.

Dr. C. A. Lindsley, the eminent sanitarian and efficient secretary of the State Board of Health of Connecticut, was appointed to open this discussion, but is unavoidably absent and has asked me to do it in his stead.

We have been associated on city and State Boards of Health for about a quarter of a century, and while I speak as a layman (I am not a physician), I know that he essentially agrees with me, in the matter under consideration.

The question before us may be discussed, but it can not be categorically answered. State Boards of Health are the creations of Legislatures. The States themselves give them their powers, define their functions and duties, and furnish the means for their administration. The details of the conditions and the problems involved in the several States are very unlike, and the most cursory examination of the several acts establishing the State Boards shows that they differ greatly in their special duties, and in their powers. In some states their duties are very wide as to what they shall do, and their powers as to how they may do it, in other States, is very limited.

Public sanitation, from its very nature, must be mostly local in its application, that is, most of its work relates directly to some local community. Hence, it is largely administered by local boards, and its expenses met by local taxation. State Boards, as their names signify, naturally deal with those more general matters which relate to the health of the state as a whole. They have only the powers conferred upon them by the State, and the appropriations for their support are for doing that which the state has created them to do. Consequently, some State Boards have powers conferred and duties imposed upon them which other State Boards do not have. One State will do through its centralized authority what another state requires of its Local Boards. Hence, work that is lawful and appropriate

for one State Board is not expected of, or even lawful for, another.

In my own State, Connecticut, the town as the political unit has much greater relative importance than in most of the other States, and the county has less. Each and every town in the State has, and by law must have, a board of health, upon which is imposed the duties of local sanitation, with the powers necessary to execute them. They may make local ordinances to suit their special needs and conditions. There is in each county a "County Health Officer," so-called, who is a lawyer approved by the courts, and whose function and duty is to aid the local health officials within his jurisdiction in enforcing their orders. Over all these is the State Board of Health, which has an oversight of the town boards, but which has only advisory powers. It has neither the authority to do local work nor State appropriation to pay for it should it assume that power. It is obvious that the Board I represent here could not furnish diagnoses for the 168 towns in our State.

Laws of the neighboring States impose other duties and provide for much wider work for their State Boards. They may make local milk inspections, order local sewerage done and employ engineers to plan the local work, and so on through a wide range of details. I need not further specify the difference between the State Boards as to powers, functions, duties and appropriations. When the state empowers its Board to do special or local work, and appropriates money from its treasury to pay for it, it needs no argument to prove that it is clearly the duty of that Board to do that work.

Let us now apply these plain facts to the question under discussion. I infer that the real question in the mind of the proposer refers chiefly to the diagnosis of Diphtheria and Typhoid Fever, and, to a less degree, to Small-pox, Scarlet Fever, and such rare or imported diseases as Typhus Fever, Plague, Cholera and the like.

As regards the last, the question would settle itself in the majority of cases. Small-pox has now become so rare a disease in most States that sometimes it is not recognized by the physicians attending the pest cases. I think it probable that every one of you has had official experience in this matter. It seems to me, however, that in such cases the authorities which have to deal with disease should be the judges as to diagnosis, unless there is serious difference between the authorities themselves and the com-

munities which they serve and in which the cases occur. Even then, if the Local Board is the authorized and empowered authority to deal with it, and the State Board is not and has no authority in the matter, then it must exercise its own judgment as to whether it takes a hand in the quarrel or not. No rule can be laid down in such cases; each must be considered by itself.

Doctors sometimes disagree as to diagnosis of Scarlet Fever (I had an uncomfortable experience in such a case once in my own family), but in the vast majority of such cases I question if anything is gained by the State Board interfering unless called upon by the community, which is more especially concerned.

With Diphtheria and Typhoid Fever the matter is somewhat different. By laboratory methods these diseases may often be diagnosed with convincing certainty in cases where that is impossible by the old methods; of the practical importance of such diagnosis in these diseases there is no doubt whatever. But that is not the question under discussion, which is, should the state do this local work? I very much doubt it, and for several reasons.

To be of practical use to the patient the laboratory test must be made quickly. In most states geographical difficulties prevent this, except by the establishment of many local laboratories, each of which could efficiently serve but a restricted district, for time is such an important matter. The laboratories would of necessity be local affairs for local advantages, although supported by the State at large. They would be built in the centers of denser population, and the tax-payers of the sparsely settled country districts be asked to help support the local sanitary appliances of the cities. It seems to me that they might as justly be asked to help pay for the sewers of the city. When we provide for doing such work by the state we open the way for very unequal benefits, and it may be also for burdensome expenditures. What might be practicable for Rhode Island, Connecticut or Delaware might be very impracticable for Texas, California or Colorado.

In the administration of our national and state governments there is an almost universal tendency for the several departments, bureaus and boards to reach outward and downward into the domain of other organizations. One board or bureau gradually pushes its work into the field of another. National Bureaus and Boards crowd each other, and also quietly reach out and assume work and power

that belongs to the State. State Boards press into the territory belonging to other Boards of the same State, and reach down and usurp work that belongs to county, city or town. It is a continual reaching out and grasping for more territory, more power and the handling of larger appropriations.

I feel that a conference of State Boards of Health, such as I am addressing, should resist such tendencies and temptations, not encourage them. I believe that it is the duty of the State Board to increase the efficiency of the Local Boards, not to assume their work, and by this remove the local responsibility.

That State Board of Health does its own work the best that lets the work of others alone, that encourages and co-operates with its sister Boards of Charity, Correction, Public Works and the like, not where it tries to assume their functions; where it encourages the Local Boards under it, co-operates with them, strengthens them, makes them feel their own responsibility, not when it assumes their work, weakens their power and weakens their responsibility.

My own belief is that the assumption by the State of a work so local as the diagnosis of disease would tend to weaken the very foundations of local sanitation, that is, that it would weaken the local sense of responsibility in sanitary matters. So far as is possible, the duty and responsibility of public sanitation should rest on the local communities, rather than upon some centralized authority, located, it may be, many miles away.

There are many functions and duties that naturally belong to all State Boards of Health, and which pertain to the State as a whole, but, it seems to me that the diagnosis of disease in its several towns is not one of them, except in rare cases. Nevertheless, it must be kept in mind that a State may choose to do any kind of sanitary work, general or local, and appropriate money for it, and make it the duty of its State Board of Health to do it. A State has that right and nearly all the States practice on it in one way or another. This State provides for one kind of investigation or service, that State for another, and when, in its wisdom, a State imposes special duties upon its Health Board, it is clear that the Board shall perform them to the extent of its ability.

Therefore, to the question, "Should the State Board of Health furnish diagnosis of contagious or infectious dis-

ease?" I would answer, if the State makes this one of the duties and responsibilities of its Board, then, yes ; emphatically, yes. "To what extent?" to the fullest extent that the State provides means for. But, if the State or municipal law puts that duty and responsibility upon the Local Boards, and the local tax-payers pay for it, that I say, no.

DR. U. O. B. WINGATE, Milwaukee, Wis. : I proposed this question for the reason that it is one which is now coming prominently before the State Boards of Health in a number of States. It is my opinion, unless the Legislature specifies that this shall be a duty of the State Board of Health, and makes an appropriation for doing the work, that the Board is going beyond its functions in meddling with it. And then there is another feature of the question. If the State Board of Health enters into this kind of work, there is no restriction as to how far they can go.

It seems to me that the State Board of Health would be meddling with work of the individual physician without leave of warrant. Physicians at the present day should be competent to make their own diagnoses. State Boards of Health should not be called upon to do it for them unless, perhaps, as a matter of courtesy upon being requested to do so in some particular instances, such as Small-pox, for example ; but even then the diagnosis should be confirmed by the Local Board, and the matter should not be brought before the State Board unless the Legislature specifically states that State Boards of Health shall do so.

DR. H. M. BRACKEN, Minneapolis, Minn. : In Minnesota we are very much interested in this bacteriological work.

If a State Board of Health has the power to quarantine, it certainly should have the power to make diagnosis, because without a positive diagnosis the need of quarantine would not be proven.

In Minnesota, Local Boards of Health have the power to quarantine. They can appeal to the State Board for support in their actions.

The State Board of Health of Minnesota considers the bacteriological laboratory a very important feature in its work. It has a thoroughly equipped laboratory, and competent bacteriologists, so that it is prepared to do rapid and thorough work. Circulars are sent to the physicians throughout the State, encouraging them to use this laboratory in their investigation of infectious diseases. Very few doctors have the facilities in their office for making

bacteriological examinations. Dr. A. may make a diagnosis of Diphtheria ; Dr. B. may say the case is not Diphtheria. The State Board of Health can be appealed to, to settle the dispute beyond all controversy. The people of the State have a perfect right to demand that a diagnosis shall be confirmed by the State Board of Health before their homes are quarantined. Of course, it is not right for the State Board to enter into competition with the physicians, if the latter is perfectly capable of making his own microscopical and bacteriological examinations, but the vast majority of doctors are neither capable of making these delicate tests, nor have they the time or the apparatus ; and therefore the State supplies this deficiency, to the great benefit of the people of the State at large.

DR. BENJAMIN LEE, Philadelphia, Pa. : In my State, as in Minnesota, the State Board of Health has the power of domestic quarantine. We are compelled to use it constantly from the fact that outside of our incorporated cities and boroughs, no such thing as a Local Board of Health exists. Of course this condition of affairs is a very unfortunate one, as you can readily see what an immense area is left without any local sanitary protection.

In cases where Boards of Health exist, we are often called upon to settle disputes as to diagnoses. If a Board of Health appeals to us for this purpose, we say : " We will send you an inspector to decide the diagnosis, but you must pay for his services ; the State Board can not do this for you gratuitously." We say to the Local Boards in the many small towns where they have no means of making bacteriological tests, for so much a year according to your population, we will furnish you a report, as a rule within twenty-four hours from the time the specimen is received, determining the character of the disease.

Many towns avail themselves of this privilege. We also offer individual physicians throughout the State the same facilities for a fixed charge for each test.

PROF. W. H. BREWER, New Haven, Conn. : In the State of Connecticut every town has a Local Board of Health operating under a State law. There are 168 towns in the State, and there is no town so small that it has not its Local Board of Health ; and if it does not of itself appoint a Health Officer, then the State Board can appoint a man and name his salary. That is about the only absolute power the State Board of Health in Connecticut has. We

have the general and advisory oversight of all the Local Town Boards.

DR. GARDNER T. SWARTS, Providence, R. I.: Does each town have its own laboratory for bacteriological examination?

PROF. W. H. BREWER, Connecticut: There are not more than two or three towns in the State which have bacteriological laboratories. Many of the towns employ the laboratory at New Haven which is run in connection with the Yale Medical College.

DR. HENRY B. BAKER, Michigan: It seems to me that where State Boards of Health do so much for the Local Boards in the way of settling diagnoses that it prevents a proper development of the health service throughout the State. In Michigan the State has a complete laboratory for bacteriological examinations. This laboratory is in charge of a skilled director, with competent assistants, but it goes no farther. If examinations are wanted they must be paid for; that is, the cost must be paid. I believe with Dr. Wingate, of Wisconsin, my next neighbor on the west, that it is hardly the function of the State Board of Health to make a business of supplying diagnoses. In Michigan we have many local bacteriologists who are doing this work and who would not have entered upon it if the State had occupied the field; for instance, in the city of Kalamazoo, they have a city bacteriologist who is right on the ground. Physicians can have their diagnoses confirmed very promptly. I think the same is true of the city of Detroit, but I consider the centralizing of this business in the hands of the State Board of Health a mistake.

DR. H. M. BRACKEN, Minneapolis, Minn.: I do not think the State Board of Health should enter into competition with local physicians who may be doing bacteriological work, but there are many localities in which there is no competent bacteriologist. Before enforcing quarantine against any infectious disease the Local Health Board should have the diagnosis confirmed, if possible, bacteriologically, and it should have the right to appeal to the State Board of Health for the confirmation of such diagnosis.

DR. GARDNER D. SWARTS, Providence, R. I.: I agree in a measure with what Dr. Bracken has said. Certainly we should not pronounce the quarantine until the diagnosis is assured. Who shall confirm the diagnosis? I doubt if there is one physician in this room who considers him-

self a skilled bacteriologist. Not one physician in a hundred can afford to own and maintain a complete bacteriological laboratory, and if he could afford it he would not have the time to make his examinations properly. I think it devolves upon the Local Board and upon the State Board to confirm diagnoses. This is the one feasible way to control epidemics.

THURSDAY MORNING, AUG. 19, 1897.

PROPOSED BY HENRY B. BAKER, M. D., MICHIGAN.

"HOW FAR SHOULD MANDATORY MEASURES GO IN DEALING WITH (a) MEASLES, (b) WHOOPING-COUGH, (c) LEPROSY, (d) TUBERCULOSIS?"

REMARKS, IN OPENING THE DISCUSSION, BY HENRY B. BAKER, LANSING, MICH.

MEASLES.—I believe such measures should extend—1. To compulsory notification, by the householder, of every case not already reported by a physician; compulsory notification by the physician of every case, and possibly nominal compensation, say ten cents for each such report. On this point of compensation to physician, I am not sure that it is necessary. It is so provided in the Michigan law. Dr. Rohé, in an able paper on this subject, says: "The report of deaths and contagious diseases should be considered by the physician as a high public duty; one that he alone can satisfactorily perform, and for which he should scorn to ask or receive compensation."

"A Connecticut court has declared that 'it is universally understood to be one of the implied and necessary conditions upon which men enter into society and form governments, that sacrifices must sometimes be required of individuals for the general benefit of the community, for which they have no rightful claim to specific compensation.' (*Bradley v. N. Y. & N. H. R. R. Co.*, 21 Conn. 306.)"*

Notification is useful:

(a) To enable the local health officer to promptly act for the restriction of the disease.

(b) To serve as a starting point for the supplying of

*Proceedings of Public Health Conference, Baltimore, Md., Feb. 17 and 18, 1897, Pp. 24-25.

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facts for compilation, in order to learn the facts needed for intelligent dealing ~~with the subject~~.

(c) To enable the local health officer to notify the State Board of Health, to receive from the State Board of Health leaflets of instructions how to restrict the disease, and to distribute such leaflets liberally to the neighbors of infected premises.

Relative to Measles, and to any other disease concerning which the people, generally, are not convinced of the importance of restricting the disease, the most important work by health authorities is the education of the people, as to the extent of the danger from the disease, the fact that the disease may be restricted, and as to the great gain in life, health, and money values by the restriction of the disease. Compulsory notification is essential as a starting point for any systematic work. And that should certainly be enforced, and educational work should be pushed to the utmost.

2. I believe mandatory measures *should* extend to the prompt isolation of every infected person and thing; and to their disinfection before coming in contact with healthy persons. But for the restriction of any disease, the action by the people themselves is as important as the action by the health officials. Unless the co-operation of the people can be had, isolation of infected persons can not be enforced. In Michigan, the law specifying the duties of health officers makes it their duty to order the isolation of every sick and infected person, unless the Local Board of Health directs the health officer differently. The Local Board of Health is supposed to be able to judge of the public sentiment in its locality, and whether restrictive measures can or can not be enforced. Local Boards, however, sometimes begin their efforts out of the order of best sequence. In the city of Detroit, recently, there has been a marked instance of an unsuccessful effort at the forcible restriction of Measles, unsuccessful because the forcible restriction was commenced before the people had been educated as to the importance of restricting Measles.

As regards Measles, and in fact every communicable disease the restriction of which is to be commenced in any locality, the first effort should be for the education of the people as to the necessity for action.

I believe it is a general law that people can not be taught on any subject except they first have their interest awakened. When there is no threatening danger of a dis-

ease people can not be taught relative to it. When there is immediate danger they can be taught. These facts in sociology supply the reason why the first mandatory requirement is for compulsory notification of the occurrence of Measles in order that advantage may be taken of the knowledge of its occurrence to educate the neighbors of the infected persons and premises.

I believe the best plan is for the State Board of Health to supply the educational data and statements, and for the local health officers to distribute such data and statements.

As fast as communities are sufficiently educated to co-operate for the restriction of Measles, or any other disease, the restriction of that disease should be enforced by the compulsory isolation of all infected persons and things and their complete disinfection before permitting their unrestricted movement.

WHOOPING-COUGH.—Precisely the same remarks made relative to Measles may properly be made relative to Whooping-cough.

LEPROSY.—In Michigan and in most of the States of this Union, there is no case of Leprosy, and in my opinion the danger of the introduction of Leprosy in those States is so small that the disease may almost be disregarded. The education of the people relative to Leprosy has already been accomplished in most States. It is generally recognized as a dangerous communicable disease. Therefore, in most States, nothing stands in the way of the approved methods of restricting such a disease, namely isolation of infected persons and things, and their disinfection before permitting unrestricted movement.

In any State or Province in which there is Leprosy and in which the necessity for restrictive measures in Leprosy is not generally recognized, I believe it is the imperative duty of the State or Provincial Board of Health immediately to take such action as shall tend to create an intelligent public sentiment which shall make it possible to limit the disease to the present generation, or at least to a restricted area.

In my judgment, mandatory measures should extend to (1) compulsory notification by the householder and by the physician, (2) isolation of every infected person, and (3) disinfection of every possibly infected thing.

TUBERCULOSIS.—What I have said relative to the education of the people concerning Measles, I wish to have con-

sidered repeated concerning Tuberculosis, which I believe to be the most important disease.

Mandatory measures should include compulsory notification, and the distribution of instructions to patients, relatives of patients, and others liable to be infected.

Disinfection of every infected thing should also be mandatory.

In Tuberculosis in animals I think that isolation or destruction should be insisted upon.

I think that isolation of human beings having Tuberculosis should not be uniformly insisted upon.

I believe that it is practicable for intelligent and conscientious consumptives, even in the stage of the disease when the danger to the public is greatest, to so carefully disinfect the sputa, and to so dispose of all infected discharges, that the public need not be endangered by the unrestricted movements of such consumptives.

But Consumption, being in every State in the Union, the most dangerous communicable disease with which we have to deal, mandatory measures should extend to the isolation of every person who is likely to spread the infection of that disease. This would include all insane consumptives, and all others who are not sufficiently intelligent and conscientious to take such measures as to thoroughly prevent the spread of the disease.

In Michigan, the phraseology of the law specifying the duties of the health officer is such that this can be done. The law makes it the duty of the health officer "to order the prompt and thorough isolation of those sick or infected with such disease, so long as there is danger of their communicating the disease to other persons." This seems to me to be the correct plan. In every doubtful case, some official should be the judge whether or not there is danger to the public. On this subject, the local health officer is, as a rule, likely to be the best judge. In coming to conclusions in such cases local health officers may well be aided by clear statements formulated by the State Board of Health. Such statements would tend toward uniformity of action throughout a State.

If this Conference can formulate clear and concise statements on this subject, it will undoubtedly tend toward uniformity of action throughout this continent.

But uniformity of action is of infinitely less consequence than correct action, and unless the action favored is the

best possible action there had best be no attempt at uniformity.

Dr. Lee, of Philadelphia, was heartily in accord with the position taken by Dr. Baker in his paper. He said his Board had published a pamphlet on Measles, calling attention to its serious character and the large mortality therefrom. He said the people needed to be educated on these subjects.

Dr. U. O. B. Wingate, of Wisconsin, did not think there should be rigid quarantine of Measles and Whooping-cough, but he did not think both diseases should be reported, and, in case of Measles, should be placarded. He did not believe in rigid quarantine in these cases, but thought Scarlet Fever should be classed with Small-pox and rigidly quarantined.

Mr. Brewer, of Connecticut, said that twenty years ago he tried to get the school board of his city to exclude children with Measles, but he was met by the statement that this was an infantile disease and all had to have it, and the sooner the better, but now there was no trouble in getting the school board to take all necessary measures to restrict this disease.

The report of a Committee on Transportation and Disinfection of Bodies Dead of Contagious Disease was read by Dr. J. N. Hurty.

Mr. J. H. Sharer, of Alliance, Ohio, president of the National Funeral Directors' Association, spoke in advocacy of the report and introduced Mr. Hohenschuh, who spoke in favor of the proposed rules and also in favor of the employment of licensed embalmers only.

He was followed by Mr. H. P. Dearing, who said that the hands of the health officers would be upheld in whatever they decided upon, but he asked that uniform rules be adopted so that if a body was shipped from one State it could pass through other States without violating their laws.

Mr. Dearing was followed by Prof. Barnes, of the Chicago College of Embalmers, and spoke in advocacy of the proposed rule. The report which had been read by Dr. Hurty was discussed in detail by members of the Conference, and with a few changes was adopted as follows:

REPORT OF A COMMITTEE APPOINTED TO PRESENT TO THE
NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH,
FOR CONSIDERATION, RULES FOR THE TRANSPORTA-
TION OF DEAD BODIES.

To the National Conference State Boards of Health:

GENTLEMEN—At a joint conference of representatives of State and Provincial Boards of Health, Funeral Directors and Baggage Agents, convened at Cleveland, Ohio, Wednesday, June 9, 1897, the undersigned were appointed a committee to recommend for your consideration certain modifications in the present rules for the transportation of dead bodies.

The Conference was suggested by a committee of the American Association of General Baggage Agents appointed for that purpose, and the meeting was attended by the following named gentlemen:

FOR BOARDS OF HEALTH.

DR. H. B. BAKER, Secretary State Board of Health of Michigan.
DR. M. MEYEROVITZ, Member State Board of Health of Illinois.
DR. J. N. HURTY, Secretary State Board of Health of Indiana.
DR. C. O. PROBST, Secretary State Board of Health of Ohio.
DR. P. H. BRYCE, Secretary Provincial Board of Health of Ontario.

FOR THE FUNERAL DIRECTORS' ASSOCIATION.

J. H. SHARER, President	Alliance, Ohio.
CHAS. A. MILLER, Treasurer	Cincinnati, Ohio.
P. W. HOHENSCHUH	Iowa City, Iowa.
L. T. CHRISTIAN	Richmond, Va.
GEORGE BILLOW	Akron, Ohio.
J. S. PEARCE	Philadelphia, Pa.
F. W. FLANNER	Indianapolis, Ind.

FOR THE GENERAL BAGGAGE AGENTS' ASSOCIATION.

J. E. QUICK, Grand Trunk Ry. System	Toronto, Ont.
C. E. BYRAM, Fitchburg R. R.	Boston, Mass.
E. A. SADD, C. B. & Q. Ry.	Chicago, Ill.
P. WALSH, A. T. & S. F. R. R.	Topeka, Kan.
W. H. GUMMERE, L. V. R. R.	So. Bethlehem, Pa.
H. P. DEARING, Michigan Central R. R.	Chicago, Ill.

In the discussion of the subject at Cleveland it was conceded that while the General Baggage Agents' Association rules, adopted July, 1889, were in the line of progress, and an improvement upon the methods that generally obtained previous to their adoption, certain additions and modifications thereof in several States had resulted in confusion and a lack of uniformity. It was granted that in the absence of any regulations grading and licensing embalmers, such modifications were not made without reason. It was agreed further that there had been sufficient progress in sanitary science and the practice of disinfecting and preparing dead bodies for shipment to warrant a modification of Rule No. 1, and to permit the transportation of bodies dead of certain specified diseases which are now prohibited under that rule, provided such bodies are prepared for shipment by funeral directors known to be skilled in the practice of disinfecting the dead.

In submitting the appended rules for your consideration, it should be understood that we recommend that they be put into effect only in those States and Provinces where those practicing the art of disinfecting the dead are examined and licensed by competent judges, whose licenses should be approved by the State or Provincial Boards of Health, or other State authority.

We believe transportation companies should be authorized to carry through to destination bodies prepared in conformity with these rules, and would urge that in the meantime a united effort be made to secure in all the States the necessary legislation to enable the people to transport their dead under the safeguards proposed.

This is recommended both as a humane and a sanitary measure. It is conceded that legal control of the practice of medicine is necessary. Physicians should be competent; so also should everyone entrusted with sanitary work, and especially of such highly important work as disinfecting dead bodies, which, if not thoroughly and scientifically done, may as well be left undone. If legal precautions concerning physicians are in the interests of the people and the public health, and intended to prevent loss of human life and spread of contagious and infectious disease, through ignorance, then the interests of the people should in like manner be protected by preventing the ignorant or unprincipled from invading homes and assuming to prepare bodies for shipment or burial when by so doing they are likely to cause the spread of disease and death.

We believe the matter is not without remedy. There are a number of schools and colleges where a technical knowledge of disinfecting and of scientific methods of preparing the dead may be obtained by those wishing to fit themselves for the work; and we believe that all proposing to engage in this special work should be required to prepare themselves to pass a satisfactory examination, and should be licensed as recommended above. Said license should confer the special legal title of Embalmer.

With these precautions we believe that bodies dead of Diphtheria, Scarlet Fever, Glanders, Anthrax, and Leprosy may be prepared so as to be transported without danger to the public health.

It may be urged that immediate burial will insure protection against the spread of disease. Granted. But is it humane, or have we the right to insist upon this when there are those sufficiently skilled in the art of preparing dead bodies for shipment to make the transportation of such bodies perfectly safe? Persons anxious to bury their dead in home cemeteries and in their own lots, often prepared at great expense, should not be deprived of this privilege.

We believe that humane sentiments which surround the dead often tempt the bereaved, also the physicians and undertakers, to make misrepresentations in order that bodies dead of contagious diseases may be transported. If, as there is reason to suspect, bodies dead of Diphtheria and Scarlet Fever are now sometimes transported in the face of rules to the contrary, is it not in the interest of the public health to control such shipments rather than to undertake to prohibit them?

These recommendations do not contemplate that undertakers or funeral directors, not licensed by State authority as provided in the rules herewith submitted, shall be prohibited from practicing their profession in cases where death has resulted from a non-contagious disease, or where the body is not to be transported. Our contention is, that bodies dead of certain contagious diseases, when properly prepared, may be transported without danger to the public; and that only those who have shown by examination a sufficient knowledge of the subject should be permitted to prepare such bodies for transportation. As the transportation of bodies dead of a contagious disease is now practically prohibited, these rules would not materially change the present status of the undertaker, as regards his business relations. To remove any apprehension that burdensome changes may be imposed for preparing bodies for transportation as here recommended, we would call attention to declaration of members of the National Funeral Directors' Association, who publicly stated, at the Cleveland meeting, that the expense of such preparation should not exceed \$25.

In the interest of uniformity and to enable State health officials to more closely supervise the transportation of dead bodies as herein suggested, we recommend that a uniform form of transit permit be adopted, a combined physician's or coroner's certificate, health officer's permit for removal, and

funeral director's paster, to be made in duplicate. The signature of physician or coroner, health officer and funeral director, should be on both original and duplicate copies, the original to accompany the body to destination and the duplicate to be forwarded to the official in charge of the baggage department of the initial line, and by him to the secretary of the State or Provincial Board of Health of the State or Province from which said shipment was made.

On account of the danger (in contagious diseases) from members of the household of the deceased who might accompany the body, we would recommend that in such cases the Local Board of Health, or health officer, should be required to certify in the transportation permit that proper precautions have been taken to prevent the conveyance of disease in this manner, and to name in the permit the persons authorized to go with the corpse.

RULES RECOMMENDED FOR THE TRANSPORTATION OF DEAD BODIES.

Rule 1. The transportation of bodies dead of Small-pox, Asiatic Cholera, Yellow Fever, Typhus Fever or Bubonic Plague, is absolutely forbidden.

Rule 2. The bodies of those who have died of Diphtheria (Membranous Croup), Scarlet Fever (Scarlatina, Scarlet Rash), Glanders, Anthrax or Leprosy, shall not be accepted for transportation unless prepared for shipment by being thoroughly disinfected by (a) arterial and cavity injection with an approved disinfectant fluid, (b) disinfecting and stopping of all orifices with absorbent cotton, and (c) washing the body with the disinfectant, all of which must be done by an embalmer holding a certificate as such, approved by the State Board of Health or other State health authority. After being disinfected as above, such body shall be enveloped in a layer of cotton not less than one inch thick, completely wrapped in a sheet and bandaged, and incased in an air-tight zinc, tin, copper or lead-lined coffin, or iron casket, all joints and seams hermetically soldered, and all enclosed in a strong, tight wooden box, or the body being prepared for shipment by disinfecting and wrapping as above may be placed in a strong coffin or casket, and said coffin or casket encased in an air-tight zinc, copper or tin case, all joints and seams hermetically soldered, and all enclosed in a strong outside wooden box.

Rule 3. The bodies of those dead of Typhoid Fever, Puerperal Fever, Erysipelas, Tuberculosis and Measles, or other dangerous communicable diseases other than those specified in Rules 1 and 2, may be received for transportation when prepared for shipment by filling cavities with an approved disinfectant, washing the exterior of the body with the same, stopping all orifices with absorbent cotton and enveloping the entire body with a layer of cotton not less than one inch thick and all wrapped in a sheet and bandaged and encased in an air-tight coffin or casket, provided that this shall apply only to bodies which can reach their destination within forty-eight hours from time of death. In all other cases such bodies shall be prepared for transportation in conformity with Rule 2. But when the body has been prepared for shipment by being thoroughly disinfected by an embalmer holding a certificate as in Rule 2, by the State Board of Health, the air-tight sealing may be dispensed with.

Rule 4. The bodies of those dead of diseases that are not contagious, infectious or communicable, may be received for transportation when encased in a sound coffin or casket and enclosed in a strong, outside wooden box, provided, they reach their destination within thirty hours from time of death. If the body can not reach its destination within thirty hours from time of death, it must be prepared for shipment by filling cavities with an approved disinfectant, washing the exterior of the body of the same, stopping all orifices with absorbent cotton and enveloping the entire body with a layer of cotton not less than one inch thick, and all wrapped in a sheet and bandaged, and encased in an air-tight coffin or casket, but when the body has been prepared for shipment by being thoroughly disinfected by an em-

balmer, holding a certificate as in Rule 2, by the State Board of Health, the air-tight sealing may be dispensed with.

Rule 5. In cases of contagious, infectious or communicable diseases, the body must not be accompanied by persons or articles which have been exposed to the infection of the disease, unless certified by the health officer as having been properly disinfected; and before selling passage, ticket agents shall carefully examine the transit permit and note the name of the passenger in charge, and of any others proposing to accompany the body, and see that all necessary precautions have been taken to prevent the spread of disease. The transit permit in such cases shall specifically state who is authorized by the health authorities to accompany the remains. In all cases where bodies are forwarded under Rule No. 2, notice must be sent by telegraph to the health officer at destination, advising the date and train on which the body may be expected. This notice must be sent by or in the name of the health officer at the initial point, and is to enable the health officer at destination to take all necessary precautions at that point.

Rule 6. Every dead body must be accompanied by a person in charge, who must be provided with a passage ticket, and also present a full first-class ticket marked "corpse," for the transportation of the body, and a transit permit showing physician's or coroner's certificate, health officer's permit for removal, undertaker's certificate, name of deceased, date and hour of death, age, place of death, cause of death, and if of a contagious, infectious or communicable nature, the point to which the body is to be shipped, and when death is caused by any of the diseases specified in Rule No. 2 the name of those authorized by the health authorities to accompany the body. The transit permit must be made in duplicate, and the signatures of the physician or coroner, health officer and undertaker must be on both the original and duplicate copies. The undertaker's certificate and paster of the original shall be detached from the transit permit and pasted on the coffin box. The physician's certificate and transit permit shall be handed to the passenger. The whole duplicate copy shall be sent to the official in charge of the baggage department of the initial line, and by him to the Secretary of the State or Provincial Board of Health of the State or Province from which said shipment was made.

Rule 7. When dead bodies are shipped by express the whole original transit permit shall be placed upon the outside of the box and the duplicate forwarded by the express agent to the Secretary of the State or Provincial Board of Health of the State or Province from which said shipment was made.

Rule 8. Every disinterred body dead from any disease or cause shall be treated as infectious or dangerous to the public health, and must not be accepted for transportation unless said removal has been approved by the State or Provincial health authorities having jurisdiction where such body is to be disinterred, and the consent of the health authorities of the locality to which the corpse is consigned has first been obtained, and all such disinterred remains must be inclosed in a hermetically sealed (soldered) zinc, tin or copper lined coffin or box.

Bodies deposited in receiving vaults will be treated and considered the same as buried bodies. Signed: J. N. HURTY,
C. O. PROBST.

Appended hereto will be found the stenographer's transcript of the entire proceedings of the Conference of General Agents, Health Officials and Funeral Directors, held at Cleveland, Ohio, June 9, 1897; also a letter to Mr. Dearing from Mr. Christian, of Richmond, Va., containing criticisms and suggestions on the rules offered by this commit-

tee, also a letter of criticisms and suggestions to Mr. Dearing from Dr. Barnes, of Chicago.

RICHMOND, VA., July 31, 1897.

H. P. Dearing, Esq., Chicago, Ill.:

MY DEAR SIR—I have just received a stenographic copy of the meeting of the joint committees at Cleveland, also have the *Ohio State Bulletin*, for July (Exhibit A), which I enclose you; I presume you have them. The *Bulletin* contains a report of the committee from the joint conference to the National Conference of the State Boards of Health, which meets at Nashville, Tenn., on the 18th prox. The rules published in the report differ materially from those adopted at Cleveland. I do not know who made the alterations. I presume whoever did, thought it for the best.

I urge no objection to Rules 1 and 2, except add to Rule 2 that portion of Rule 5 which refers to notifying health officers at destination, etc., that it may not be overlooked. Closing the orifices, etc. It is practically impossible to do this effectually; the nasal may be plugged, but the wind pipe and the throat will be left open. This will be a dead letter and should be eliminated from the rules. It reminds me of a man I knew, who put cotton in the nasal, thinking it would prevent the discharge caused by abdominal decomposition.

(EXHIBIT A.)

TRANSPORTATION OF DEAD BODIES.

Our readers, we feel sure, will not complain if we devote most of our space in this issue to publishing Rules and Regulations Governing the Transportation of Dead Bodies, and an argument, to be presented to the National Conference of State Boards of Health urging their adoption. There is no more vexatious question with which health authorities have to deal than this matter of shipping dead bodies. If satisfactory and uniform rules can be put in force throughout the United States and Canada, Boards of Health and the public will be greatly relieved.

The Ohio Board has desired for some time to amend its rules relating to this subject, and it is to be hoped this movement will result in desired changes.

REPORT OF A COMMITTEE APPOINTED TO PRESENT TO THE NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH, FOR CONSIDERATION, RULES FOR THE TRANSPORTATION OF DEAD BODIES.

To the National Conference State Boards of Health:

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DR. M. MEYEROVITZ, Member State Board of Health of Illinois.

DR. J. N. HURTY, Secretary State Board of Health of Indiana.

DR. C. O. PROBST, Secretary State Board of Health of Ohio.

DR. P. H. BRYCE, Secretary Provincial Board of Health of Ontario.

FOR THE NATIONAL FUNERAL DIRECTORS' ASSOCIATION.

J. H. SHARER, President	Alliance, Ohio.
CHAS. A. MILLER, Treasurer.....	Cincinnati, Ohio.
P. W. HOHENSCHUH.....	Iowa City, Iowa.
L. T. CHRISTIAN	Richmond, Va.
GEORGE BILLOW.....	Akron, Ohio.
J. S. PEARCE	Philadelphia, Pa.
F. W. FLANNER.....	Indianapolis, Ind.

FOR THE GENERAL BAGGAGE AGENTS' ASSOCIATION.

J. E. QUICK, Grand Trunk Ry. System	Toronto, Ont.
C. E. BYRAM, Fitchburg R. R.....	Boston, Mass.
E. A. SADD, C., B. & Q. Ry	Chicago, Ill.
P. WALSH, A., T. & S. F. R. R.....	Topeka, Kan.
W. H. CUMMERE, L. V. R. R.....	So. Bethlehem, Pa.
H. P. DEARING, Michigan Central R. R.....	Chicago, Ill.

In the discussion of the subject at Cleveland it was conceded that while the General Baggage Agents' Association rules, adopted July, 1889, were in the line of progress and an improvement upon the methods that generally obtained previous to their adoption, certain additions and modifications thereof in several States had resulted in confusion and a lack of uniformity. It was granted that in the absence of any regulations grading and licensing embalmers, such modifications were not made without reason. It was agreed further that there had been sufficient progress in sanitary science and the practice of disinfecting and preparing dead bodies for shipment to warrant a modification of Rule No. 1, and to permit the transportation of bodies dead of certain specified diseases which are now prohibited under that rule, provided such bodies are prepared for shipment by funeral directors known to be skilled in the practice of disinfecting the dead.

In submitting the appended rules for your consideration, it should be understood that we recommend that they be put into effect only in those States and Provinces where those practicing the art of disinfecting the dead are examined and licensed by competent judges, whose licenses should be approved by the State or Provincial Board of Health or other State authority. We believe transportation companies should be authorized to carry through to destination bodies prepared in conformity with these rules, and would urge that in the meantime a united effort be made to secure in all the States the necessary legislation to enable the people to transport their dead under the safeguards proposed.

This is recommended both as a humane and a sanitary measure. It is conceded that legal control of the practice of medicine is necessary. Physicians should be competent; so also should every one entrusted with sanitary work, and especially of such highly important work as disinfecting dead bodies, which, if not thoroughly and scientifically done, may as well be left undone. If legal precautions concerning physicians are in the interests of the people and the public health, and intended to prevent loss of human life and spread of contagious and infectious disease, through ignorance, then the interests of the people should in like manner be protected by preventing the ignorant or unprincipled from invading homes and assuming to prepare bodies for shipment or burial when by so doing they are likely to cause the spread of disease and death.

We believe the matter is not without remedy. There are a number of schools and colleges where a technical knowledge of disinfecting and of scientific methods of preparing the dead may be obtained by those wishing to fit themselves for the work; and we believe that all proposing to engage in this special work should be required to prepare themselves to pass a satisfactory examination, and should be licensed as recommended above. Said license should confer the special legal title of Embalmer.

With these precautions we believe that bodies dead of Diphtheria, Scar-

let Fever, Glanders, Anthrax and Leprosy may be prepared so as to be transported without danger to the public health.

It may be urged that immediate burial will insure protection against the spread of disease. Granted. But is it humane, or have we the right to insist upon this when there are those sufficiently skilled in the art of preparing dead bodies for shipment to make the transportation of such bodies perfectly safe? Persons anxious to bury their dead in home cemeteries and in their own lots, often prepared at great expense, should not be deprived of this privilege.

We believe that human sentiments which surround the dead often tempt the bereaved, also the physicians and undertakers, to make misrepresentations in order that bodies dead of contagious diseases may be transported. If, as there is reason to suspect, bodies dead of Diphtheria and Scarlet Fever are now sometimes transported in the face of rules to the contrary, is it not in the interests of the public health to control such shipments rather than to undertake to prohibit them?

These recommendations do not contemplate that undertakers or funeral directors, not licensed by State authority as provided in the rules herewith submitted, shall be prohibited from practicing their profession in cases where death has resulted from a non-contagious disease, or where the body is not to be transported. Our contention is, that bodies dead of certain contagious diseases, when properly prepared, may be transported without danger to the public; and that only those who have shown by examination a sufficient knowledge of the subject should be permitted to prepare such bodies for transportation.

As the transportation of bodies dead of a contagious disease is now practically prohibited, these rules would not materially change the present status of the undertaker, as regards his business relations.

To remove any apprehension that burdensome charges may be imposed for preparing bodies for transportation as here recommended, we would call attention to declarations of members of the National Funeral Directors' Association, who publicly stated, at the Cleveland meeting, that the expense of such preparation should not exceed \$25.

In the interest of uniformity and to enable State health officials to more closely supervise the transportation of dead bodies as herein suggested, we recommend that a uniform form of transit permit be adopted—a combined physician's or coroner's certificate, health officer's permit for removal, and funeral director's paper, to be made in duplicate. The signature of physician or coroner, health officer and funeral director, should be on both original and duplicate copies, the original to accompany the body to destination and the duplicate to be forwarded to the official in charge of the baggage department of the initial line, and by him to the Secretary of the State or Provincial Board of Health of the State or Province from which said shipment was made.

On account of the danger (in contagious diseases) from members of the household of the deceased who accompanied the body, we would recommend that in such cases the Local Board of Health, or health officer, should be required to certify in the transportation permit that proper precautions have been taken to prevent the conveyance of disease in this manner, and to name in the permit the persons authorized to go with the corpse.

*RULES RECOMMENDED FOR THE TRANSPORTATION OF DEAD BODIES.

Rule 1. The transportation of bodies of persons dead of Small-pox, Asiatic Cholera, Yellow Fever, Typhus Fever or Bubonic Plague is absolutely forbidden.

Rule 2. The bodies of those who have died of Diphtheria (Membranous Croup), Scarlet Fever (Scarlatina, Scarlet Rash), Glanders, Anthrax or

*As amended by L. T. Christian, Richmond, Va.

Leprosy, shall not be accepted for transportation unless prepared for shipment by being thoroughly disinfected by (a) arterial and cavity injection with an approved disinfectant fluid, (b) disinfecting and stopping of all orifices with absorbent cotton, and (c) washing the body with the disinfectant, all of which must be done by an embalmer, holding a certificate as such, approved by the State Board of Health or other State authority. After being disinfected as above, such body shall be enveloped in a layer of cotton not less than one inch thick, completely wrapped in a sheet and bandaged, and encased in an air-tight zinc, tin, copper or lead lined coffin, or iron casket, all joints and seams hermetically soldered, and all enclosed in a strong, tight wooden box. Or, the body being prepared for shipment by disinfecting and wrapping as above, may be placed in a strong coffin or casket and said coffin or casket encased in an air-tight zinc, copper or tin case, all joints and seams hermetically soldered, and all enclosed in a strong outside wooden box.

Rule 3. The bodies of those dead of Typhoid Fever, Puerperal Fever, Erysipelas or other dangerous communicable disease other than those specified in Rules 1 and 2, may be received for transportation when prepared for shipment by filling arteries and cavities with an approved disinfectant, washing the exterior of the body with the same, stopping all orifices with absorbent cotton, and enveloping the entire body with a layer of cotton not less than one inch thick, and all wrapped in a sheet and bandage. In all other cases such bodies shall be prepared for transportation in conformity with Rule 2.

Rule 4. The bodies of those dead of diseases that are not contagious, infectious or communicable, may be received for transportation when enclosed in a sound coffin or casket and enclosed in a strong outside wooden box, provided they reach their destination within thirty hours from time of death. If the body can not reach its destination within thirty hours from time of death it must be prepared for shipment by filling arteries and cavities with an approved disinfectant, washing the exterior of the body with the same, stopping all orifices with absorbent cotton and enveloping the entire body with a layer of cotton not less than one inch thick, and all wrapped in a sheet and bandaged.

Rule 5. In cases of contagious, infectious or communicable diseases, the body must not be accompanied by persons or articles which have been exposed to the infection of the disease unless certified by the health officer as having been properly disinfected; and before selling passage tickets agents shall carefully examine the transit permit and note the name of the passenger in charge, and of any others proposing to accompany the body, and see that all necessary precautions have been taken to prevent the spread of disease. The transit permit in such cases shall specifically state who is authorized by the health authorities to accompany the remains. In all cases where bodies are forwarded under Rule No. 2 notice must be sent by telegraph to the health officer at destination, advising the date and train on which the body may be expected. This notice must be sent by or in the name of the health officer at the initial point, and is to enable the health officer at destination to take all necessary precautions at that point.

Rule 6. Every dead body must be accompanied by a person in charge, who must be provided with a passage ticket, and also present a full first-class ticket marked "corpse," for the transportation of the body, and a transit permit—showing physician's or coroner's certificate, health officer's permit for removal, undertaker's certificate, name of deceased, date and hour of death, age, place of death, cause of death, and if of a contagious, infectious or communicable nature the point to which the body is to be shipped, and when death is caused by any of the diseases specified in Rule No. 2, the name of those authorized by the health authorities to accompany the body. The transit permit must be made in duplicate, and the signatures of the physician or coroner, health officer and undertaker must be on both the original and duplicate copies. The undertaker's certificate and paster of the original shall be detached from the transit permit and

pasted on the coffin box. The physician's certificate and transit permit shall be handed to the passenger. The whole duplicate copy shall be sent to the official in charge of the baggage department of the initial line, and by him to the Secretary of the State or Provincial Board of Health of the State or Province from which said shipment was made.

Rule 7. When dead bodies are shipped by express the whole original transit permit shall be placed upon the outside of the box and the duplicate forwarded by the express agent to the Secretary of the State or Provincial Board of Health of the State or Province from which said shipment was made.

Rule 8. Every disinterred body dead from any disease or cause shall be treated as infectious or dangerous to the public health, and must not be accepted for transportation unless said removal has been approved by the State or Provincial Board of Health having jurisdiction where such body is to be disinterred, and the consent of the health authorities of the locality to which the corpse is consigned has first been obtained, and all such disinterred remains must be enclosed in a hermetically sealed (soldered) zinc, tin or copper lined coffin or box. Bodies deposited in receiving vaults will be treated and considered the same as buried bodies.

Signed: H. P. DEARING,
J. N. HURTY,
C. O. PROBST,
Committee.

Rule 3. By all means this should be added before the last paragraph: "Enveloping in cotton, wrapping and bandaging is not required when the body has been thoroughly embalmed and disinfected by a regularly licensed embalmer," with, of course, closing the orifices business, left out.

I beseech you to add the above to Rule 3. Bodies of persons dying from these causes are shipped daily, and some other cause of death given, and this will continue, if this rule stands as it is, and as a State health official, I want the public protected, at the same time I want as little embarrassment to the afflicted as possible.

Rule 4. Please add the following to this rule: "Closing orifices, etc., enveloping with cotton, wrapping and bandaging is not required when the body has been thoroughly embalmed by a regularly licensed embalmer." The licensed or approved embalmer is recognized only in Rule 2. Do not, therefore, class indolence with industry; let the fellow with vim keep ahead of his slothful competitor. Strike out communicable diseases in the second line, that it may not conflict with cases in Rule 3.

Rule 6. The physician's or coroner's certificate is taken up and filed by the Board of Health issuing the transit permit. Where there is no Local Board of Health at initial point, the physician's or coroner's certificate should accompany the corpse.

I think this rule should be re-written and made very plain. As it now stands serious trouble is liable to occur with inexperienced baggage agents at the initial points. The pastes to go on the outside box should contain the necessary information, but many funeral directors object to disfiguring the box with the unsightly large blanks now in use on some lines of roads. A uniform Board of Health's transit permit should be adopted by the Conference at Nashville, as the forms used in some States at present give very little information, not sufficient to record intelligently at destination.

Rule 8. Would suggest that the last clause be changed to read: Bodies deposited in receiving vaults twenty-four (24) hours that are not embalmed will be considered the same as bodies that have been buried. Embalmed bodies may remain in receiving vaults ten days before being classed as disinterred bodies.

I hope you may see the wisdom of these suggestions, which are hastily written. In my humble judgment, they detract in no way from the protection of public health, in transporting dead bodies. On the other hand greater safe-guards are provided, and funeral directors will be encouraged to deliver bodies in better condition for transportation.

The meeting of our State Association on the 18th prox. will prevent my being with you at Nashville, as I had anticipated. I hope, however, Messrs. Sharer and Hohenschuh will be able to be present.

With courteous regards, I remain,

Yours truly,
L. T. CHRISTIAN, Chairman.

Enclosed is a copy of rules with changes, as herein suggested, which I hope you will approve of and present in lieu of those published in the Ohio *Bulletin*:

RULES RECOMMENDED FOR THE TRANSPORTATION OF DEAD BODIES.

Rule 1. The transportation of bodies of persons dead of Small-pox, Asiatic Cholera, Yellow Fever, Typhus Fever, Bubonic Plague, is absolutely prohibited.

Rule 2. The bodies of those who have died of Diphtheria (Membranous Croup), Scarlet Fever (Scarlatina, Scarlet Rash), Glanders, Anthrax or Leprosy, shall not be accepted for transportation, unless prepared for shipment by being thoroughly disinfected by arterial and cavity injection with an approved antiseptic embalming fluid, washing the body with the disinfectant, all of which must be done by a regularly licensed embalmer, holding a certificate as such, and approved by the State Board of Health, or other State authority. After being disinfected as above, such body shall be enveloped in a layer of cotton not less than one inch thick, completely wrapped in a sheet and bandaged; and incased in an air-tight zinc, tin, copper or lead-lined coffin or iron casket, all joints and seams hermetically soldered, and all incased in a strong outside wooden box. Or the body, if prepared for shipment by disinfecting and wrapping as above, may be placed in a strong coffin or casket encased in an air tight zinc, copper or tin case, all joints and seams hermetically soldered and all encased in a strong outside wooden box. In all cases where bodies are forwarded under this rule, notice must be sent by telegraph to the health officer at destination, advising the date and time as near as possible on which the body may be expected. This notice must be sent by, or in the name of, the health officer at the initial point. This is to enable the health officer at destination to take all necessary precaution at that point.

Rule 3. The bodies of those dead of Typhoid Fever, Puerperal Fever, Erysipelas or other dangerous communicable diseases, other than those specified in Rules 1 and 2, may be received for transportation when prepared for shipment by filling cavities with an approved antiseptic embalming fluid, washing the exterior of the body with the same, and enveloping the entire body with a layer of cotton not less than one inch thick, and all wrapped in a sheet and bandaged, provided that this shall apply only to bodies that can reach their destination within forty-eight hours from time of death. Enveloping in cotton, wrapping and bandaging is not required when the body has been thoroughly embalmed and disinfected by a regularly licensed embalmer, as referred to in Rule 2. In all other cases such bodies shall be prepared for transportation in conformity with Rule 2.

Rule 4. The bodies of those dying of diseases that are not contagious, infectious or communicable, may be received for transportation when encased in a sound coffin or casket and encased in a strong outside wooden box, provided they reach their destination within thirty hours from time of death. If the body can not reach its destination within thirty hours from time of death it must be prepared for shipment by filling cavities with an approved antiseptic embalming fluid, washing the exterior of the body with the same, and enveloping the entire body with a layer of cotton not less than one inch thick, and all wrapped in a sheet and bandaged. Enveloping with cotton, wrapping and bandaging, is not required when the body has been thoroughly embalmed by a regularly licensed embalmer, as referred to in Rule 2.

Rule 5. In case of contagious, infectious or communicable diseases, the

body must not be accompanied by persons or articles which have been exposed to the infection of disease, unless certified by the health officer as having been previously disinfected, and before selling passage tickets, agents shall carefully examine transit permit, note the name of the passenger in charge, and of any others proposing to accompany the body, and see that all necessary precautions have been taken to prevent the spread of the disease. The transit permit shall specifically state who is authorized by the health authorities to accompany the remains. This rule does not apply to shipment under Rule 3.

Rule 6. Every dead body must be accompanied by a person in charge who must be provided with a passage ticket, and also present a full first-class ticket marked "corpse," for the transportation of the body. The Board of Health's transit permit, or the physician's or coroner's certificate, giving the name of the deceased, date and hour of death, place of death, age, color, condition (single or married), occupation, birth-place, cause of death, if of contagious or communicable nature, and point to which the body is to be shipped; and when death is caused by any of the diseases in Rule 2, the names of those authorized by the health authorities, or attending physician or coroner, to accompany the body shall be given. With the health officer's permit, physician's or coroner's certificate, the funeral director's certificate shall be presented, stating the manner in which the dead body has been prepared, the Board of Health's transit permit, or the physician's or coroner's certificate and funeral director's certificate must be made in duplicate. The funeral director's certificate from the original must be pasted on the outside box, containing the remains, and the health officer's permit, or physician's or coroner's certificate (the original) to be held by the passenger in charge, and the duplicate copy shall be sent to the baggage department of the initial line, and by him to the Secretary of the State or Provincial Board of Health, of the State or Province from which the shipment was made.

Rule 7. When dead bodies are shipped by express, the whole original transit permit as stated in Rule 6 shall be pasted on the outside box, and the duplicate copy forwarded by the express agent to the Secretary of the State or Provincial Board of Health from the State or Province from which said shipment was made.

Rule 8. Every disinterred body, dead from any disease or cause, shall be treated as infectious or dangerous to the public health, and must not be accepted for transportation, unless said disinterment has been approved by the State or Provincial Board of Health having jurisdiction where such body is interred, and the consent of the health authorities of the locality to which the corpse is to be consigned has first been obtained; and all such disinterred remains must be encased in a hermetically sealed (soldered) zinc, tin, or copper lined coffin or box. Bodies deposited in receiving vaults twenty-four hours that are not embalmed will be considered the same as bodies that have been buried; embalmed bodies may remain in receiving vaults ten days before being classed as disinterred bodies.

July 8, 1897.

H. P. Dearing, Chicago, Ill.:

DEAR SIR—I have carefully examined the proceedings of the Cleveland meeting, and have also noted the changes made by the committee composed of yourself, John N. Hurty and Dr. Probst. I have also read with interest the letter received from Mr. L. T. Christian, of Richmond, Va.

I am inclined to believe that the rules as published in the *Ohio Sanitary Bulletin* are the best, regardless of either of the factions represented at Cleveland, and will serve the cause of humanity and the public safety better than the previous regulations, or the proposed regulations as they appear in the stenographic report of the Cleveland conference.

I have a suggestion, however, that I may present for your consideration. In Rule 2 strike out the words "regularly licensed," as marked in the enclosed pamphlet. It should read, "all of which must be done by an em-

balmer, holding a certificate approved by the State Board of Health, or other State authority."

The power to license embalmer only exists in four States: Virginia, Alabama, Pennsylvania and Missouri, and if the words "regularly licensed" were left in Rule 2, the rules could only be carried out in the four States above named. If the words "regularly licensed" are stricken out of Rule 2, then the State Boards of Health can practically adopt such measures as they best see fit, for the regulation of the practice of embalming in all of the States irrespective of existing so-called Boards of Embalmers in the four States named. They could then act the same as the Illinois State Board of Health in licensing physicians. If the applicant does not hold a certificate from a recognized college, they can compel him to pass a satisfactory examination before the Board.

In Rule 3 I think it would be well to add the word "arterial," changing the rule so it will read: "May be received for shipment when properly disinfected by arterial and cavity injection with an approved disinfectant embalming fluid."

I think this necessary, as Typhoid Fever and Puerperal Fever are classed in this rule, and modern investigation has proven that the blood of the typhoid subject contains means of communicating the disease, and it is an established fact that the germs of Septicaemia (Puerperal Fever) are found in the blood in the vascular system, or in both the arteries and veins.

In Rule 4, in the sixth line, I think it should read: "It must be prepared for shipment by filling arteries and cavities with an approved disinfectant embalming fluid."

The reason I suggest this is because cavity embalming is seldom more than temporary in its effects, and if the body is to be shipped a considerable distance, then it should be thoroughly preserved by injecting the arteries as well as the cavities.

These few changes are all that I could desire in the interest of public health, but I believe it would be well to strike out the 30 or 48 hour clause and permit bodies properly prepared to be shipped to any part of the United States.

Yours very respectfully,

CARL L. BARNES, M. D.,
President Chicago College of Embalming.

STATE OF IOWA, OFFICE OF ATTORNEY-GENERAL,
IOWA CITY, IA., August 5, 1897.

W. P. Hohenschuh, Esq., Iowa City, Iowa:

My DEAR SIR—Your favor of the 4th inst. at hand, and in reply I will say that the State Board of Health of this State have the authority "to make such rules and regulations and such sanitary investigations as they may, from time to time, deem necessary for the preservation and improvement of public health." The rules made by the State Board of Health relating to the transportation of bodies of persons who have died of contagious diseases are made under the authority thus expressly given by statute. The rules made in pursuance of this authority have the force and effect of law.

The Legislature of this State has enacted no statute directly prohibiting the transportation of bodies of deceased persons, or prescribing any regulations. The whole matter is left by the Legislature to the wise discretion and judgment of the State Board of Health. There is no law in this State which prevents the State Board of Health from modifying the rules now in force with reference to the transportation of such bodies, and if the Board of Health were convinced that bodies of persons having died of infectious diseases could be prepared so as to be transported without danger to the public it is certainly within their power to amend the rules so as to permit the same to be done. Any change in the present order in this respect must be made by the Board of Health.

I see nothing in the statute that would prevent the Board of Health from

examining embalmers and giving a certificate of qualifications, and so amend their rules as to permit bodies prepared by such embalmers to be transported if, in their judgment, the same could be done with safety to the public health.

I think the whole matter rests in the sound judgment of the Board of Health, and if they are convinced that the plan suggested is a wise one there is no legal obstacle in the way of their giving effect to the proposed plan by adopting proper rules.

Inclosed I return the pamphlet which you sent. Yours truly,
MILTON REMLEY.

After the adoption of the report, as revised, Dr. Henry B. Baker, Michigan, made the following motion:

Moved: That the Secretary of this Conference be directed to send to the executive officers of each State and Provincial Board of Health and other State Health Authority a copy of the rules for the transportation of dead bodies, adopted by this Conference, together with the formal request that each State and Provincial Board of Health shall take such action as will tend most completely to promote these measures.

CONFERENCE
OF
GENERAL BAGGAGE AGENTS, HEALTH OFFICIALS
AND FUNERAL DIRECTORS.

A Conference of representatives of the National Association of General Baggage Agents, of State and Provincial Boards of Health and of the National Funeral Directors' Association was held at the Hollenden Hotel, Cleveland, O., June 9, 1897. The following persons were present :

For the National Funeral Directors' Association:

Messrs. J. H. SHARER, Pres., Alliance, Ohio.
CHAS A. MILLER, Treas., Cincinnati, Ohio.
W. P. HOHEN SCHUH, Iowa City, Iowa.
L. T. CHRISTIAN, Richmond, Va.
GEO. BILLOW, Akron, Ohio.
J. S. PEARCE, Philadelphia, Pa.
F. W. FLANNER, Indianapolis, Ind.

For Boards of Health:

DR. H. B. BAKER, Secretary State Board of Health of Michigan.
DR. MEYEROVITZ, Member State Board of Health of Illinois.
DR. J. N. HURTY, Secretary State Board of Health of Indiana.
DR. C. O. PROBST, Secretary State Board of Health of Ohio.
DR. H. H. BRYCE, Secretary Provincial Board of Health, Ontario.

For the General Baggage Agents' Association:

Messrs. J. E. QUICK, Grand Trunk Ry. System, Toronto,
Ontario.
G. E. BYRAM, Fitch R. R., Boston, Mass.
P. WALSH, A. T. & S. F. R. R., Topeka, Kan.

Messrs. E. A. SADD, C., B. & Q. R. R., Chicago, Ill.

W. H. GUMMERE, L. V. R. R. Co., Bethlehem,
Pa.

H. P. DEARING, Mich. Cen. R. R., Chicago, Ill.

Mr. H. P. Dearing was made Chairman and Dr. C. O. Probst, Secretary.

The President stated that the object of the meeting was to bring about a united effort to secure uniform regulations for the safe transportation of dead bodies.

Mr. L. T. Christian was called upon to open the discussion from the standpoint of a funeral director.

Mr. CHRISTIAN: Mr. Chairman and Gentlemen—Being a funeral director, and having followed that profession for twenty years, I am naturally interested in the transportation of dead bodies. I opened correspondence with the President of the New York Funeral Directors' Association regarding the propriety of rearranging, or endeavoring to get the National Association to rearrange, its regulations as to the transportation of bodies dead of certain diseases. This gathering must be exceedingly gratifying, not only to the funeral directors, but to the transportation companies and to the Boards of Health. We feel, without detaining you, that the funeral director is in position to honestly, candidly and without any bias motive, lay before you the plain and practical means that will enable you to accomplish the purpose which you desire, the transportation of dead bodies, without trouble to the railroads, without unnecessary charge or hazard, without unnecessary trouble to us, and without unnecessary expense to the bereaved whom we are called upon to serve. We feel that through the efforts of several years of sacrifice and labor with us, advancement has been made in the profession of funeral directors that will enable us to occupy a position in the future that has not been accredited to the profession in the past. And gentlemen, we lay our matters before you in a plain, frank and honest manner. We are uninfluenced by professional motives, nor are we governed by prejudices. We realize the danger to the public of putting a dead body in a baggage car that ought not to go there. We recognize the fact that a great many men enter the profession as funeral directors who are not competent. Those are things we want to guard against. Without further remarks, Mr. Chairman and Gentlemen, I will suggest that Mr. Hohen-schuh, who is a funeral director, and a gentleman who has had a long and considerable experience in the transporta-

tion of dead bodies, and who has given scientific, careful and intelligent study to the question, enlighten you as to the possibilities of carrying out the work which we are endeavoring to accomplish.

MR. HOHENSCHUH: Mr. Chairman and Gentlemen—I had the pleasure of being a member of the committee of our National organization a number of years ago at Detroit, where I met Mr. Dearing and two other gentlemen from your Association, and this subject that we are working on to-day was brought up at that time. The science of embalming at that time was in its incipiency—rather new, and we were not able at that time to give positive evidence as to the results of our work. Since that time not only embalmers, but bacteriologists all over the world, have been working on disinfectants, and when we get down to the question of embalming it is nothing but the disinfection of dead bodies. By that I mean the destruction of the disease germs, especially those which are infectious and contagious and dangerous to those who come in contact with them not only in transportation, but at the end of the trip. For a long time it was contended that the chemicals which are used for disinfection were inadequate to the purpose, but within the last few years we have a number of new chemicals, one of which is of special interest to sanitariums all over the world at the present. That we call formalin, a gas which may also be bought in liquid form, and is largely used at the present time as a disinfectant. There is no doubt as to its efficacy and as to its destruction of disease germs, even those which have great resistance. We know that in the organism of decomposition and putrefaction we have some which are as resisting as those of infectious and contagious diseases. It is an undisputed fact that an embalmer who is qualified to do his work can take most any body within a reasonable time after death and so preserve it that there will be no further decomposition or putrefaction. A gentleman of our committee to-day has in his possession a body dead for twenty-seven months, and I have in my possession a body dead for fourteen months, and it is in a perfect state of preservation. I have made personal experiments with this disinfectant, using sheep inoculated with anthrax germs, and I have had most remarkable results. I have experimented later with tissues and so forth in the use of this new disinfectant, formalin, and we can refer you to experiments that have been made all over the world in regard to

the penetrating powers of this gas through wools and cotton and other tissues as a disinfectant. We are ready to answer any questions on that point of disinfection. The point we are getting at now is this, to give recognition to embalming and to give recognition to those who understand how to embalm. We recognize the fact that every undertaker in the United States puts out his sign as an embalmer when he may know nothing at all of anatomy, nothing of physiology, of chemistry and bacteriology. We claim that it is necessary that they should know something of all these, especially in relation to the treatment of the dead body, and we only ask that some restrictions be removed from those qualified. We believe that there are some rules and regulations which are very lax with regard to those who are not qualified, so that the modifications of the rules should be such that it will place restrictions about those who can not properly prepare a body and might remove some from those who can prepare a dead body properly. I find in some places they have a good deal of trouble in the transportation of Typhoid, and I believe it is possible to prepare a body dead of Typhoid Fever so it can be transported. And I believe it is possible by arterial injection to inject a body dead from Diphtheria and safely transport it. We recognize that pseudo-membrane in the throat can not be reached by arterial injection, but we can so apply chemicals directly to the infected parts as to destroy every germ in that dead body, and in addition wrap it in disinfected cotton to prevent the passage of any organism that might be left on the outside. I don't believe in putting a body in an air tight casket hermetically sealed; but start with a disinfectant put inside of that body and there is no danger of transporting a body of that kind. Care should be taken to know who is qualified to do it. We propose to leave that to the highest authority in the State upon that subject, the State Boards of Health whom we recognize. It is only a question as to the classifying of these things. I do not believe in the transportation of Yellow Fever, Smallpox, Puerperal Fever and Typhus Fever; but some should be taken out of that class and some put in restricted classes.

Question: You don't propose that Diphtheria should be taken out, do you?

MR. HOHENSCHUH: I believe that that should be prohibited if it does not go through the hands of some one approved of by your Board of Health as qualified to prepare

that body. It should be embalmed properly and it should be hermetically sealed.

DR. HURTY: To bring this matter to a head, suppose we strike out Diphtheria from the Rule 1, reading: "The transportation of bodies of persons dead of Small-pox, Asiatic Cholera, Leprosy, Typhus Fever or Yellow Fever, is absolutely forbidden. Unembalmed bodies should not be transported over 100 miles, dead from any cause."

MR. WALSH: Where I come from they have a great many gunshot wounds and accidents. These bodies are put in common caskets and transported. We have about eighteen hours' time in preparing them, and, in many cases, that is perfectly safe. In other cases it would not do, but I think that is a matter that ought to be considered seriously, the length of time and not the mileage.

MR. FLANNER: I am afraid you will be a little bit tangled about this timing it. A body is shipped eighteen hours after death from Indianapolis. It may want to go out to Kansas City. Now, unless the baggage man has some way of proving time of death, the body might be on the way a good deal over your time limit, probably thirty-six hours.

DR. BAKER: As to Rule 1—I understand the question is on Rule 1, and the suggestion is to take Diphtheria from Rule 1 and class it in Rule 2. Now, on that subject, I think we ought to hear from two States. Ohio and Iowa. Ohio is represented here by Dr. Probst, and I would like to hear from Dr. Probst.

DR. PROBST: Mr. Chairman, the question has come before our Board on a number of occasions, but we have never arrived at a satisfactory solution of what should be done with bodies dead of Diphtheria. When the General Baggage Agents' Association sent us their circular some years ago proposing that certain rules be adopted with reference to transportation of dead bodies, the matter was considered by our Board, and while the rules were not all as we thought they should be, they were adopted by the Board for the reason that we could see an advantage in having uniform rules throughout the States and we hoped they would be adopted by other State Boards of Health. Those rules provided that those dead of Diphtheria should be enclosed in hermetically sealed caskets and wrapped with sheets saturated with a bichloride solution. Under that rule we had trouble. Complaints came to us that bodies had been shipped from one point to another alleged to have

been enclosed in hermetically sealed caskets when they were not. We had further trouble in controlling the opening of such caskets at the place of burial, especially where some one had died far from home and had to be shipped to his home. For that reason, one or two States, possibly Iowa and Pennsylvania, placed Diphtheria in class one, and the Ohio Board amended its rules and classed Diphtheria among the non-transportable bodies. We have had a good deal of trouble under that rule; some one of the undertakers spoke of being faced by people who desire to ship the remains of their dead children; we have had that to go through with ourselves. I remember one very aggravating case where a prominent gentleman from Wheeling, West Virginia, had been visiting in Mansfield, Ohio, lost his child, died there from Diphtheria. He was a Jew and wished to inter his child at his home in the Jewish cemetery, and he offered to charter a train, if necessary, to take the health officer of Mansfield along with him, and to follow any precautions that might be prescribed by the State Board of Health, if we would allow him to take the body to Wheeling; but that was denied him because we thought if we made an exception in one case we would lose control of the matter. We desire to amend the rule if it can be done with safety to the public. This question was brought up some time ago and was referred to the National Conference of the State Boards of Health. That body met at Chicago last June and the question was discussed as to whether these rules should be amended in that particular. It was finally referred to a committee to report at the next meeting as to what was feasible, and what could be accomplished in the preparation of bodies, so as to make it possible to have them safely transported. I am not very much in favor of this embalming idea if it can be done in any other way. It would be practically impossible for us to control the transportation in our State if we depend entirely upon embalming methods, for the reason, as stated by a gentleman here, that there is at present not one man in ten who could be depended upon to safely embalm a body. In many places in this State it would be impossible to secure the services of a competent undertaker, and it would be very difficult indeed to carry out such regulations.

I want to hear evidence presented upon that side of the subject. I have hoped that this meeting might lead up to suggestions as to the method which would make it possible

to transport dead bodies of Diphtheria, and perhaps other bodies, with perfect safety.

MR. FLANNER: Is it not feasible for you to do as a State what the Chicago Board of Health has done as a city? Any undertaker who wants a privilege or license as an embalmer, let him go to the State Board of Health and pass an examination. If you are satisfied in the first place that by the proper embalming of a body dead from Diphtheria and Scarlet Fever the germs of the disease can be destroyed, and if that man comes to you and shows that he has a proper knowledge of embalming and disinfecting, you could issue him a certificate as a licensed embalmer. Now, isn't it practical for you to do that? It is not mandatory, it is simply presumptive. You see the effect of such a law. Mr. Miller here gets a license as a registered embalmer, with permission to ship bodies, and his competitor is compelled to do the same thing. I really think the strongest laws of any community are not the mandatory laws but the presumptive laws. The first question is, will the embalming of a body, arterially, destroy the germs of contagious diseases so it is safe to ship it? And second, would you be willing for the funeral directors to come to you for examination and issue them such certificates?

DR. MEYEROVITZ: Mr. Chairman and Gentlemen—I am not a public speaker, and I don't intend to make a speech, but I shall say all I desire to say. I was pleased to listen to the eloquent remarks made by the previous speaker pertaining to the suggestions made by the last speaker. It will meet with favor by the Illinois State Board of Health.

MR. BRYCE: We have listened with a great deal of pleasure to the discussion. I am, in many ways, quite in accord with the gentlemen of the Undertakers' Association.

You will all understand that theory is one thing, carrying out theory into practical working is another thing, and that State officials and city officials are responsible, not for theory, but for the results in practice. Dr. Probst has practically stated the experience of the State health officer and similarly that of the city officer of health. His State is very similar indeed, both as to population and in some respects large towns, to that of Ontario. We, therefore, can speak of conditions as found in daily practice. We have in our Province, probably, some 4,000 cemeteries. Of those graveyards, 2,000 are in rural places, without care; not even attached to the church. In those places the bodies are buried by the farmers themselves.

The authorities are required under the act to see that a private burial takes place in contagious diseases. It is very hard to get that always. Country people want to go in to see their friends, and they think it a hardship that they should not. We have, then, to deal with two questions, first, the danger from the house to the general public, and second, the question of removing the body over the rail, wherein you have the danger to a much larger public. We are hoping to get to that stage of evolution very soon where the health officer will have nothing to do but attend to the public health. If such an officer existed, a case of Diphtheria could readily be transported to its home after having been prepared by a registered embalmer. We are not at that stage yet, so the health officer has to deal with the danger to the general public. First, of allowing the body to go at all. Second, the criticism of delay in keeping the body in the house if it must be embalmed. Third, the practical question of giving prescribed rights to undertakers. In the West the people are so absolutely against that that they can not get any recognition by the Legislature, and the very moment that we, as a Board of Health, attempt to discriminate between undertakers we are entering the political field and would get into trouble at once. In practice, so far as we are concerned, we have not yet evolved any method of prescribing conditions whereby we could be assured of what I believe to be a fact, namely, safe transportation through prior perfectly safe embalming. Now, if those are the facts and they are with us, and, I think, in most States, the question comes down to one thing in practice, what diseases are of a character as regards their infectious nature as to make them a real positive danger to the public, and what other diseases are owing to their special kind so little likely to transmit disease to the general public that they can, with very ordinary care, be prepared for safe transportation across the continent. I think that is a practical question. We have, I think, in the temperate climates here two definitely drawn classes of diseases. We all know them in one class, Scarlet Fever, Small-pox and Diphtheria. We might add others, but I think that practically covers them. We have other diseases, Tuberculosis, Typhoid Fever and others that are little likely to communicate disease by the dead body. I think in our Province a veterinary surgeon died of Anthrax. I believe that body was transported. He died through a post-mortem exami-

nation of an animal. The danger in practice is, not from the body so much as from the surroundings of the body, the people who go with the corpse, the friends who go from the infected house, the clothes hanging in the house, we have in that an element of danger. Now, turn it around in a practical way and look at the mortality. We have in the Provinces amongst the contagious diseases only one causing any considerable mortality for fifteen years; for fifteen years we have not had twenty-five deaths from Small-pox. So it is boiled down to the one pest of our climate, Diphtheria, and that occurs in the rural township even more than in cities and towns. This is the pest of our temperate climate along the lakes. What improvements have we for limiting the spread of it? Apart from anything else there is one point, the funeral shall be private and the body shall be buried in the corporation cemetery and shall stay there. By this the health officer is limiting the danger. He has done as much as he can and stops there. We have not as yet done more than hope for conditions whereby Diphtheria will be treated scientifically in every case, so that we can say we shall be able to allow transportation to the general public. The government has made an order stating that on the recommendation of the Provincial Board of Health the body of a specified person may be transported. Of course, if we could make that general, the railroads would be glad, we would be glad and the undertakers would be glad to comply with the wishes of the friends; but while it can be done in a special case, to make the law generally operative would be with us, as I am convinced, detrimental to the work of the public so far as the stamping out of this one disease, the pest in our country. It must, in my opinion, stand until we evolve to a higher civilization. In regard to the rest I am with you except Scarlet Fever. It is a disease we have got to deal with in some way, for it is still more contagious, in my opinion, than Diphtheria. We have not had much trouble with it in our country for fifteen years, but fifteen years ago it was very prevalent. Small-pox and Scarlet Fever are diseases, in my opinion, which should remain in Rule 1.

MR. CHRISTIAN: Doctor, you speak of the funeral directors as a class not being proficient in their work. Would it not be possible or probable that the Board of Health of the Province of Ontario would be willing to examine such funeral directors as would apply to them as to their pro-

ficiency, and license them to that effect, and recognize their ability in the transportation of bodies?

DR. BRYCE: A bill was before the Legislature in which a certificate was provided to be given by the Board, but there was strong feeling against it among the undertakers themselves. Immediately after it came up all the labor and trade councils of the State got up and said "here is more class legislation."

MR. DEARING: The conditions are peculiar in that two or three health officers feel handicapped on account of the laws of their States and Provinces. We have got to deal, as Dr. Bryce says, with the actual conditions. The conditions are such that certain undertakers, as well as members of the government in Ontario, are adverse to legislation looking to the licensing of undertakers. Now, the fact remains that in all these States and Territories all of our laws are formed in the interests of the general public, for protecting the people. To that end we have laws which make it necessary for men practicing medicine to pass an examination. He must present some evidence that he is skilled. I believe that the general public should be protected just as much after a death, and our laws so framed that they will give us that protection. What Dr. Bryce states of Ontario I think obtains very largely in the State of Michigan. I believe a bill was introduced there some years ago, and the same objection came up, yet people are not afraid of monopolies, because the law says a man shall be a skilled physician before he can practice his profession. I believe the health authorities should take this matter into the Legislatures as a health measure. The ignorant man will naturally oppose it. He is getting along to that point in life where he can not prepare himself for the best work, and he becomes a member of some labor organization on railroads or other lines of business; they organize, and the ignorant outvote the better informed, and they arrange a scale of wages which is not in the best interests of our best men, but in the interests of the poorest. If the State Board of Health of Ohio will take it up in Ohio, and present the matter as a health measure in the interests of the public rather than have it presented by undertakers whose motive might be misconstrued as being a selfish interest overbalancing their interest in the public, I believe that something could be accomplished, and the same would apply in Ontario and in Michigan. Our people are getting older, and families are being established and burial places fixed up at

great expense ; at the same time we travel more than our fathers did. There are more of our people who die away from home. That class of people are growing. I do not believe in any such word as "I cant." If it ought to be done there must be a way found to do it. The question is, ought it to be done? If we can go no further to-day we can start it in the State of Illinois. We have got representatives in the middle ground ; if they can unite the States of Ohio, Indiana and Illinois, Ontario and New York, then that will answer.

MR. BILLOW: Mr. Chairman, I have listened with satisfaction and interest to the remarks made. I am highly pleased with these remarks. I behold the right kind of a spirit. I don't appear in the interests of class legislation. We want to start out with this settled fact that we start out opposed to that. We don't want to jeopardize anybody's liberties nor infringe upon them, but Mr. Chairman, we appear in the interests of progress which has characterized this nation. Our business makes us public servants, and we want to be faithful to the people. The question is simply this, can a dead body dying with any disease, can it by means of chemicals be disinfected so as to make it perfectly safe for transportation? We assert positively, that it can be done. This is a question that should be put to every health officer. First, does he honestly believe that a Diphtheria case can, by means of chemicals and proper embalming, be made safe to ship. If that is so, then it is your duty as citizens and as health officers to give such laws that the people may reap the benefit therefrom. Don't hang back for the sake of timidity. Every one must contribute his share toward public understanding and public enlightenment. The question is, can health officers be made to see that bodies can be so treated as to be perfectly safe for transportation? If they can, undertakers will look to it to see that they do it right. You will not permit a pharmacist to go behind counters to fill prescriptions for the doctors unless he has a license. You will not permit a doctor to practice unless you know that he is competent to do it ; why should you allow a lot of men to go to work and cast death and disease broadcast in the community? One of your gentlemen has stated, I believe, that bodies unembalmed should not be shipped only such a distance, limiting it. Now that is a thing that enters into consideration, just as much as the disease. Let any such body die and remain uncared for, and then turn it over to

the railroad for shipment for any distance, and it would be just as dangerous as any diseased body would be. There should be proficiency in this knowledge, public interest and public safety demand it. The gentlemen that figure in the Board of Health are in a larger measure responsible for it than the ordinary citizen. You can't avoid this question ; it is your duty to attend to it, and you must not attend to it with gloves on your hands. The funeral directors, the Board of Health and the baggage masters ought to work hand in hand, and with this triple alliance there will be no fear.

MR. SHARER: It was my privilege as President of the National Association of Funeral Directors to select a committee for the purpose of meeting you to consider this matter. I simply came here to say that these gentlemen are amply qualified to represent our side of the question, but I will add my indorsement to the very emphatic expressions of practical good common sense made in the remarks of my friend Mr. Billow. I want to add this additional injunction and exact this one more thought from the physicians : that when you advise your patients, after failing in your treatment of the disease with which they are unfortunately afflicted, to go off hundreds and thousands of miles, and they die from home among strangers, I want you to exert your influence in order that the remains can be returned home, no matter what they die of. We demand this of you.

MR. PEARCE: I certainly am not a member of the committee. I came here from Pennsylvania. I have been an undertaker all my life. I agree with Mr. Billow. We certainly have made progress. I think that this is the most progressive step that the undertakers of this country have ever taken. I am satisfied that this is the first audience of this kind that has ever been congregated. I am here in a different position to-day than any other gentleman in this room. I think all of you gentlemen come from cities of this great country. I don't believe there is a hayseed here but myself. I come from the country. To be sure, I am close to Philadelphia. We have rules there which are, to some extent, the same rules that have been referred to and urged in your hearing to-day. There is a provision in our State law under these rules and regulations that such and such a matter shall be conducted in such and such a way under the provisions and conditions laid down by the Board of Health. I live in a place where there is no Board of Health. You gentlemen represent the city ; I think I

have got the biggest job on my hands to-day. I think there is a good deal of this country where no Board of Health has any power whatever. To be sure, we have a State Board of Health, but unfortunately be it said of the State of Pennsylvania, it amounts to nothing. You don't hear very much of this State Board. Rules are laid down, and we carry them out for the reason that the Pennsylvania Railroad insists upon it. It has rules that certain bodies shall be received for embalming on certain conditions, and in Philadelphia the rules are very stringent. The act of 1895 gave to all Local Boards throughout the State the power to enforce this law, and, in addition, to make laws more stringent as might be from time to time necessary. We have a great many undertakers who say these rules are too stringent and that a great many of them should be taken off the books. I am not here as one of those people; I believe there could be no rules on the books too stringent. We have, within these last few years, demonstrated to the satisfaction of the medical gentlemen all over this country (and they largely constitute the Boards of Health), and to the satisfaction of the railroads, that we can and do prepare bodies so that they are rendered absolutely harmless and can be transported all over the country.

To my mind this matter is one of very great importance. I live in a district where we have a Catholic college of 300 and a college for boys of 300 more. It is a matter of very great importance to the people who send their children to these colleges as to the rules with reference to the transportation of dead bodies.

We are here to-day not as undertakers, we are here in the interests of humanity, and I say if there is anything we can do let us do it.

AFTERNOON SESSION.

H. P. Dearing in the chair.

MR. HOHENSCHUH: We have taken up four of the rules, and agreed on something similar to what I have here.

Rule 1. The transportation of bodies of persons dead of Small-pox, Asiatic Cholera, Anthrax, Yellow Fever, Typhus Fever and Leprosy is absolutely forbidden.

Rule 2. That the transportation of bodies dead of Diphtheria, Membranous Croup, Measles and Scarlet Fever shall be forbidden unless the body has been thoroughly disinfected by an embalmer that has been authorized and approved by the health authorities; such body after having been pre-

pared must be thoroughly enveloped and remain so enveloped in a layer of cotton not less than one inch thick, and then wrapped in bandages and enclosed in a hermetically sealed metallic casket, or in an outer box lined with tin, zinc, lead or copper, and all joints and seams closely soldered.

Rule 3. Bodies of persons dying of Puerperal Fever, Typhoid Fever, Erysipelas, or other dangerous, infectious or communicable diseases other than those specified in Rules 1 and 2, may be received for transportation when properly prepared in accordance with Rule 2; except, when a body has been prepared by an authorized and approved embalmer, the bandage and wrapping with cotton and air-tight sealing may be dispensed with.

Rule 4. Bodies of persons dead from violence or of diseases that are not contagious, infectious or communicable, may be received for transportation to points that are reached within twenty-four hours after death. For distances requiring more than the above limit, the body must be enclosed in an air tight metal lined casket or case, unless such body has been previously prepared by an authorized embalmer.

MR. HOHENSCHUH: You see, the body is to be given the twenty-four hour limit where there is no embalming. If it goes further than that it requires an air-tight case or casket.

As to the formation of Boards of Health, and the requirements that might be exacted from undertakers, I know this to be a fact, that if in co-operation with the Baggage Agents' Association, they say: "You shall not ship certain cases;" you can not do it. I know in our city, in cases of Diphtheria and Scarlet Fever, the family is quarantined. I know of one case of Diphtheria within the last year where a man's business house was kept closed for three weeks because it was the rule of the Board of Health. I don't see why, if conditions can be made safe, the Board of Health can not say that they are safe. The Board of Health can go into a house and so thoroughly disinfect it that it is absolutely safe for people to go in there and live. And if it is not disinfected by some one who is qualified to do so, the Board of Health can prevent any one from going in there to live. If they can do that with the living, I don't know why they can not establish some rule for the disinfecting of the dead. In Iowa they have a committee on corpses in the Board of Health. I believe that if I should leave a body lie in a house without preservation of any kind for three or four days, and the body becomes offensive, the Board of Health have authority to order that body buried regardless of what I or the family may think of it.

BY THE CHAIRMAN: Yes, they can abate a nuisance.

MR. HOHENSCHUH: Yes, and it is just the same with these cases of transportation. We want to regulate the issuing of permits, and have it so limited that a man's

privileges can be taken away from him the first time the Baggage Agents' Association reports incompetency on his part. We do not need law for that. The baggage agents can say what they will take and what they will not take, but they depend upon the advice of the Boards of Health.

DR. BRYCE: Is there any reason why the words, "Yellow Fever," if this is to be continental, should not be taken out of this clause? Is there anything about Yellow Fever which makes it impossible for a body, for instance, to come from Jacksonville North here which would not apply to a body going from Boston to Toronto, if it had died of Diphtheria?

MR. CHRISTIAN: The question raised by Dr. Bryce is a practical one. We have had in our own city only one case of Yellow Fever, and that occurred in a family that had come from Memphis during the last scourge. I do not know what the health people might say if we were to apply to them to have Yellow Fever bodies brought to Richmond. I go upon the theory that any body can be made safe for transportation by proper care.

THE CHAIRMAN: Would you undertake to prepare a body dead from Yellow Fever for shipment?

MR. CHRISTIAN: I would sir. I'd have no hesitation to go to the room of a person that died of Small-pox. Yet it is put down that you shall not move such bodies.

THE CHAIRMAN: Is there any sentiment in the South asking for the transportation of Yellow Fever cases? In the North there is a sentiment among the people that we ought to do it.

MR. CHRISTIAN: I think if an application was made for the transfer of a body dead from Yellow Fever in a Southern State you would be prevented from moving it, and if an application was made in a State upon the hill from the sea shore to have it brought there, they would say no. But it is simply sentiment.

MR. BYRAM: The Massachusetts law reads:

No railroad corporation, or other common carrier or person, shall convey or cause to be conveyed, through or from any city or town in this Commonwealth, the remains of any person who has died of Small-pox, Scarlet Fever, Diphtheria, or Typhoid Fever, until such body has been so encased and prepared as to preclude any danger of communicating the disease to others by its transportation; and no local registrar or clerk shall give a permit for the removal of such body until he has received from the Board of Health of the city, or the select men of the town where the death occurred, a certificate stating the cause of death, and that said body has been prepared in the manner set forth in this section, which certificate

shall be delivered to the agent or person who receives the body. Any person violating the provisions of this section shall be punished by fine, not exceeding \$25.

DR. BRYCE: There are diseases here, for instance Leprosy, which are no more contagious than Tuberculosis, and yet we have Leprosy among those which have been absolutely forbidden for transportation. Anthrax practically might be left out because there has been only one death I know of in our country in all these years. Yet if our friends die of this disease, we would like to have them brought home.

MR. CHRISTIAN: The time will come when they will be brought home.

MR. FLANNER: Why don't you throw the bars down and say we can embalm anybody, which is a fact.

THE CHAIRMAN: Would you want them to make another class under Rule 1 and say you would make a specific rule to carry what we now prohibit?

DR. BRYCE: I wouldn't carry Small-pox if I had anything to do with it.

DR. PROBST: I want to call your attention to one fact regarding Massachusetts. As I understand the law, no one is permitted to exercise the functions of an undertaker except he be appointed by the State Board of Health. That gives the State Board of Health of Massachusetts control of the situation, but that is done by law of the State of Massachusetts and not by the rule of the State Board of Health. I want to place myself on record as being in favor of the sentiment of funeral directors securing a better status for themselves in Ohio, and I pledge myself to assist them in any way I can to bring it about. But I have very grave doubts whether the Board at the present time have power to license embalmers. If we could appoint funeral directors as they do in Massachusetts, then we could allow our Small-pox bodies to be transported.

MR. SHARER: I would favor the rules to stand as they have been submitted by Mr. Hohenschuh. It is a well known fact that from time immemorial Asiatic Cholera and Yellow Fever and Small-pox have been regarded with the greatest horror. In the case of Diphtheria my own experience justifies me in the conclusion that we are overly frightened. In thirty years I have buried many Diphtheria bodies of the most malignant type, and held public funerals, and I defy any one to cite an instance where the disease was communicated in that way. I believe the time

will come within the life of some of you when diseases that are now absolutely prohibited from transportation will be transported over this country just as freely, after being properly prepared, as patients dying from Consumption.

DR. BAKER: The committee that has just reported has taken from Rule 2 and put in Rule 1 Anthrax, and to that method of progression I object. I agree with Dr. Bryce, that it may be just as plausible and just as proper to take from Rule 1 some other diseases than Diphtheria.

The interest in Anthrax in the State I represent is not great enough to amount to very much, yet I should dislike to put in Rule 1 any disease that our people are likely to die from, because I should prefer to have such regulations as are prescribed in Rule 2, as it is safer and more in accord with the feelings of humanity.

MR. HOHENSCHUH: I got the idea from a pamphlet here entitled "Special Regulations of the Province of Ontario." I know Anthrax can be prepared just as well as some of the other diseases, and in the human being it is not of the serious nature that it is in the animal, so I would suggest that we drop it back to Rule 2.

THE CHAIRMAN: We are looking for an ideal, and making a list of special preparations. If you have any ideals, I think you ought to put them in. These changes will not be made unless the conditions are changed. Along with our recommendation there must be also a recommendation as to certain legislation necessary in States and Territories before this can be given effect.

Hereupon Dr. Baker moved the adoption of Rule 1 as amended, which was unanimously carried. (One negative vote.)

DR. BRYCE: Now as to Rule 2, it says in this clause, "It shall be by one who is registered or legally qualified to do it." But we haven't said what he is going to do. We must state specifically some requirements. You might have a dozen States with a dozen sets of embalmers, with a dozen different regulations.

MR. CHRISTIAN: By a thorough arterial injection of antiseptic embalming fluid.

MR. BILLOW: You must treat this matter from a professional standpoint. When you received your diploma you were not furnished with a recipe to be used in every disease. You received your diploma for the knowledge you had acquired. When these undertakers become authorized and approved professionals by virtue of the

Board of Health, it is supposable that they possess the requisite knowledge to disinfect a body according to its requirements, with such chemicals as may be proper, and there should be no formula laid down by which they should be bound to operate.

DR. HURTY: That's all right so far as the professional embalmer is concerned, but there will be so many coming in who should be governed by a certificate.

DR. BRYCE: Mr. Billow's proposition from the stand-point of an embalmer is perfectly logical. I don't propose to assume that embalming is necessary in every case, and for that reason we have to state in a more specific way how far the Board of Health would think you had to go in order to transfer the body.

THE CHAIRMAN: You do not think it is necessary to have a thorough embalming for a short distance?

DR. BRYCE: I know it is not necessary. What I do say is necessary, is to take the body after being washed in a disinfectant solution and simply wrap it in cloth that has been soaked in a good, strong disinfectant, and then take a thin film of oil skin, which will retain the fluids, and put the body in a casket and take it away. The Deputy Attorney-General said to me, recently, that it would soon be necessary to adopt some regulation by which no embalming can take place till the death has been in some way inquired into. If that is true, we don't want any embalming unless it is necessary for transportation, do we? I think we better divide the class by the French method which is carried out more systematically. They put the body in a cloth of rubber to prevent evaporation, and they can carry it to the end of the journey and put it in a crematory. In our case it would be put in a grave.

MR. CHRISTIAN: Wherever the body of a dead person is to be preserved, you must inject that body, or the parts that are liable to decompose, with preserving substances.

THE CHAIRMAN: Don't you think there could be two preparations, one for a short distance and one for a long distance? In addition to your proposition of having it wrapped in a sheet, couldn't there be some injection of some fluid in the cavities, which would not necessarily be embalming?

MR. PIERCE: It seems to me Dr. Bryce does not take into account that there is something else to do in the shipping of a body, besides preventing the spread of contagion through the distribution of germs. The placing of

that body in a hermetically sealed casket, without embalming, it seems to me, would be very dangerous, because putrefaction would set in, and the gases might burst the box. The most dangerous thing we do is when we take them after the doctors have left them. If that argument is made in order to reduce to a minimum the danger to the operator, it doesn't amount to much because there is not much danger to the operator.

THE CHAIRMAN: I don't think they care about the operator, he assumes the danger. I understand Dr. Bryce's position. We have in view all classes of people, and the idea is to make it safe, and yet as little expense as possible to people in moderate circumstances. If we could simplify the rule a little for a short distance, and then have your particular and explicit rule for thorough embalming for a longer distance, that I think is what Dr. Bryce has in mind.

MR. PEARCE: People have an idea there is such a tremendous expense connected with embalming. The majority of undertakers to-day embalm rather than keep them on ice. The doctor also referred to the injection of poisons where legal inquiry was instituted afterwards to determine the cause of danger. I have at home a certificate where a body was embalmed in over a gallon of embalming fluid, and afterward examined for traces of poison, and there wasn't a trace of poison found in the body.

MR. PEARCE: The very best fluids contain no metallic substance at all.

DR. PROBST: A body dead from Diphtheria, and prepared for a short journey, might be shipped from Michigan or Pennsylvania to Ohio and come in a very short time. But we should like to know when it is coming. I want this rule fixed so our health officer can take charge of the body when it is delivered. You know when a body is prepared that way the temptation would be irresistible, after that short distance, to view it.

THE CHAIRMAN: We should have the provision made that the telegram in such instances be sent to the health authority.

DR. PROBST: In this rule, as it is prepared, it says that these embalmers or undertakers are to be authorized and approved by the health authorities. That might mean the health authorities of the village in which this undertaker is located, and many of these villages have no local health authorities. It should be State health authority.

MR. WALSH: Who would be responsible for the telegram?

THE CHAIRMAN: I should think at the initial point the parties who shipped the body should be required to telegraph to the station at destination notifying the health authorities that a body is coming.

MR. WALSH: It is possible both might not be received within a hundred miles of that health officer.

DR. PROBST: I should like to see that notice sent by the railroad authorities.

MR. CHRISTIAN: There is not one funeral director in five hundred but would gladly embalm a body, if necessary, free of charge, in order to have the remains go all right, or if necessary for temporary transportation.

THE CHAIRMAN: In some localities there is the impression that charges for embalming are excessive, and while you are not to blame for it there is a reason for it, and possibly you could help the funeral directors in America if you could get yourselves on record in some way as to what would be a reasonable charge for a first class job. I know in Colorado charges have been made ranging from \$125 to \$175 for a job which I am satisfied ought to have been well done for \$25.

MR. CHRISTIAN: Our charges range from \$10 to \$25.

MR. WALSH: I have heard of a charge made for a body in Arizona where a party in Chicago wanted it embalmed, and was notified that it would be from \$175 to \$250. I think if we went before the Legislature and specified what a reasonable charge would be it would put a stop to this thing.

THE CHAIRMAN: We could have it understood that would be professional.

MR. SHARER: What do you hope to gain in the first paragraph of Rule 2 by the change?

DR. BRYCE: There are two reasons. In the first place if I go to my government with these regulations and ask them to amend our laws, the first question put to me will be whether I have been associating myself with a number of funeral directors and embalmers and if they didn't suggest that everybody that is going to be moved ought to be embalmed. Well, I can say, "here is a simple method by which a body can be made innocuous and sent home within twenty-four hours." We have to be very delicate in this matter in reference to anything that looks like a technicality.

MR. BILLOW: I don't believe in circumventing the truth or whipping the devil around the stump. The poison and contagion in Diphtheria is best reached and most effectually destroyed by arterial embalming done as speedily as possible. And that is the only way to serve the interests of the public. In Akron we charge all the way from nothing to \$15. Fifteen dollars is paid by very wealthy people. The poor are taken care of just as well as the rich, and where they can not pay, the material is given to them rather than allow the body to be neglected. We can not expect to have a legal fixed charge. This meeting is not called for the purpose of making money. We must be governed by circumstances. This meeting is called for the furtherance of the public welfare, wherever these railroads travel through the country, to bring safety to the people, and to bestow the best care on the dead.

THE CHAIRMAN: I feel there is an element of danger in moving all bodies. A certain amount of disinfecting could be done which need not be called embalming, and yet would give a little additional protection.

MR. HOHEN SCHUH: We are trying to give the public something that they have never had before; we are trying to move these bodies. Suppose there was a heavy expense in connection with embalming. Leave the bodies where they are left to-day. The distance of twenty-four hours is such a short distance, it would be almost prohibitive. I will take a Diphtheria body and prepare it for shipment in twenty-four hours, and do it in from twenty to thirty minutes, and I won't stop as to the expense. I don't believe in throwing the door wide open to incompetency. The greatest danger is not from the decomposed body, but at the time of death when these organism are still growing and developing. I believe we ought to have a little restriction on this thing, and that is thorough disinfection of that body, whether for twenty-four hours or for a week.

MR. SADD: These bodies which you propose to take out of Rule No. 1 and place in Rule 2 should be embalmed by a competent embalmer, not leaving it to everybody, otherwise you would be carrying disease everywhere, and Diphtheria is in my estimation worse than Yellow Fever. We have seen it on the B. & O. road at Zanesville, where a whole family was exterminated through one body being shipped to that place. I am in favor of leaving it just where it is, and if you do move it, have it done by an authorized embalmer. Of course, we haven't what would be

called an authorized undertaker. They haven't a certificate. An undertaker in Chicago told me that not one undertaker in fifty is properly qualified. We want them in Rule 2.

MR. HOHENSCHUH: We want the physicians of the State Board of Health to say whether we are qualified to prepare bodies for transportation, and whether we know enough about disease germs, and understand where to look for disease germs.

DR. HURTY: The only objection I can see is, it might impose on the Health Board duties that they do not want to assume in licensing undertakers. It would be a good thing to do in the abstract, but can we do it and not raise a storm, and cause a great deal of trouble? With that exception this is all that could be desired. If it comes to a vote, I shall vote for it.

MR. SADD: In the State of Illinois we have a competent Board, and have had for many years. It is not quite so exacting as the Iowa Board, which, I think, is the champion of all States in the Union in regard to being particular as to whom they allow to be shipped through their State. If this is put on the Boards of Health, to pass an examination and give certificates, it might be called a hardship to others. And yet we can not consider it a hardship. They are educated up to what they know, and the rest of them will try and get into the band wagon and be regular authorized undertakers. I like your efforts to move dead bodies, but I do not like to lose sight of the paramount fact that the body is dead and gone, and we are here and our children and our employes and our neighbors, and I don't like to leave a stone unturned that would protect the living, even if the dead bodies have to stay in Denver.

DR. PROBST: I doubt whether our State Board of Health would feel that under our present law we would have authority over these directors or embalmers. I believe our Board would thoroughly approve of a law which would make it necessary for an undertaker to come before the State Board of Health and pass such an examination and get a license, and I see no reason why such a law could not be passed in Ohio. The last Assembly passed a law that no one could practice plumbing in Ohio in places where they have water-works and sewers, unless he passes an examination.

DR. BAKER: I would suggest whether it would be desirable to add a few words and close, "excepting in States

where the examination of funeral directors is carried on by law."

MR. PEARCE: We have a law in Pennsylvania which has very recently created a State Board of Undertakers. It applies to cities of the first, second and third classes, and to persons outside of those cities who desire to do business in such cities. They have to take out a license. At the time the law was passed it included every undertaker engaged in business in Pennsylvania, and a large portion of those who hold licenses to-day are persons who have not passed the examination. That would not work, because there are just as many ignorant undertakers in Pennsylvania as in any other State. I think this should be passed into the hands of the medical gentlemen, because I believe that the competency of undertakers ought to be passed upon by the highest authority in the State.

MR. CHRISTIAN: I have the honor of being a member of the State Board of Embalmers of Virginia. I would be perfectly willing and glad for the State Board of Health to pass on the proficiency of the gentlemen that are permitted to do embalming in our State. We have been operating under our law for two years, and it has proved satisfactory.

MR. FLANNER: If the law is passed right to begin with it creates a State Board of Embalmers. In the laws that will be passed hereafter I am satisfied that they will be on that plan. Such a law was passed in Indiana, and it created a State Board of Embalmers, but no one was given recognition under it except upon actual examination. The fact that a man had been in business counted for nothing.

DR. BAKER: My thought was not to admit those who were merely licensed, but those who had passed an examination by the State Board of Health or the Board of Examiners created under the law.

MR. HOHENSCHUH: I was in Missouri a year ago and I saw one of the examinations conducted. Every undertaker in Missouri has a license. I believe it is better to make this law general and raise the standard in the States where they have such a law. Those who have been in the business for thirty or forty years may hope to slip through.

DR. BAKER: The examination of those who are to deal with bodies after death ought to be made not only by sanitarians, but by pathologists. My understanding of the spread of Diphteria is not the same as has been expressed in this session. My understanding is the germs do not

permeate the whole body, but are in the throat almost exclusively, and disinfection should be directed mainly to the throat. In Typhoid Fever every tissue of the body is infested by germs, and a drop of blood from the ear will reveal the disease, and this is one of the methods of diagnosis at the present time. I recognize the difficulty which Dr. Probst has suggested of executive officers of Boards of Health assuming legislative functions, but it may be the only way of accomplishing the object, and it may be that granting permission to do certain things to certain classes would not be considered legislation. This question ought to be submitted to some competent attorney before it is fully decided upon.

DR. HURTY: The railroads alone can pass these rules. They have a right to pass rules concerning the conditions under which they will receive freight and passengers under the law. If they adopt a rule and say that they will receive corpses only from undertakers who have been approved by the State Board of Health, will that be legislative on our part? I think it will simply be an official approval, as it were, of their rules.

DR. BAKER: Then should we not precede our whole action here by saying that we recommend that the railroads adopt rules as follows?

MR. HOHENSCHUH: I have an opinion on that point from the Attorney-General of our State, who says that a railroad that can make rules or regulations for receiving baggage of any kind can receive a body in such shape that the State Board of Health can comply with the rules you make. It is not legislative at all.

THE CHAIRMAN: The railroad authorities have the right to say what they will not take. I doubt if they have a right to say they would take a body dead of Small-pox in Illinois when the law says they must not. If we could get the consensus as to whether we should adopt something similar to what has been adopted by the undertakers, or make two rules of it, it would be a good thing. If we should have an organization in shape to license funeral directors and examine them, it would be in the interest of the public and it would be appreciated. The only objection is that mentioned by Dr. Bryce, that certain of the Legislatures or Parliaments might imagine we had gone too far. If we could suggest a safe method to move the cases that are now prohibited, the general public would be satis-

fied, and we could afford to wait till they have made themselves felt to their Representatives.

Here Dr. Bryce read a modification of Rules 2, 3 and 4.

DR. BAKER: I would ask Dr. Bryce if there is not this practical objection to his theory. I understand the Grand Trunk Road has carried during April 500 corpses. Is it not probable that many would be subject to unexpected delay, and does not that open a loop-hole for contingencies that would be disagreeable? We are trying to throw around the public the greatest safeguard. I rather lean toward the original report for that reason. He also says in his last version, "They shall be dipped in a solution." And the present rule says, "They shall be thoroughly saturated." A fabric can be dipped a number of times and not be thoroughly saturated.

DR. PROBST: I am in favor of the original rule. I do not like the idea of dividing these bodies into two classes. When the railroad starts with a body, it isn't always sure of getting through in twenty-four hours. And this does not say a word about embalming. It only says that a body must be thoroughly disinfected, etc. I am in favor of that.

MR. WALSH: I think the notification better be eliminated. If the railroad company delivers a body without the persons being properly notified, they are responsible for it.

MR. CHRISTIAN: So far as the notification is concerned, I think it would properly come from the funeral director, in charge of the body at the starting point. And as to whom it shall be directed, if it is going to Lansing or Chicago, I would notify the Board of Health.

THE CHAIRMAN: I think that that could be done by the railroads, the agents of the different stations telegraphing to the health authorities.

DR. BAKER: In regard to the notification it is desirable that arrangements be made in advance; at the same time if the local health officer has proper notice, he has no right to decline to take care of the body. There is a reason why the health officer should be notified in Michigan, because there is a State law requiring the health officers there to have that notice.

DR. MEYEROVITZ: I think it would be practical to state what drugs to use in the disinfecting process, and not leave it to the discretion of the funeral director.

THE CHAIRMAN: It was the concensus of opinion a mo-

ment ago that these rules are contingent upon funeral directors having passed a satisfactory examination and being recognized as professionals and having the same standing that a physician would have. The best disinfectant that we have now might be very poor in comparison with one we might have a year hence. The question is on the adoption of Dr. Bryce's substitute. All those in favor of it say aye. The motion was lost.

THE CHAIRMAN: The question is now on the adoption of the original motion.

The Secretary then read Rule 2, modified as follows:

Rule 2. The transportation of bodies dead of Diphtheria, Membranous Croup, Measles, Scarlet Fever, Glanders, Anthrax and Leprosy shall be forbidden, unless the body has been thoroughly disinfected by one who has been authorized and approved by the State health authorities.

Such bodies, after having been so prepared, must be completely enveloped and remain so enveloped in a layer of cotton not less than one inch thick, and then wrapped in bandages and enclosed in a hermetically sealed metallic casket, or in an outer box lined with tin, zinc, lead or copper, and all joints and seams soldered.

The health authorities at the point of destination shall be notified by telegraph prior to the shipment of the body.

MR. SADD: I would simply suggest that the motion be like this "resolution submitted by the committee."

MR. PEARCE: I would suggest that neither the name "undertakers" nor "funeral directors" appear in it.

MR. HOHENSCHUH: Make it read, "that the health authorities at the point of destination shall be notified by telegraph prior to the shipment of the body."

Thereupon, upon motion of Mr. Sharer, Rule 2 was adopted unanimously as last recorded.

The Secretary then read Rule 3, modified as follows:

Rule 3. Bodies of persons dying of Puerperal Fever, Typhoid Fever, Erysipelas, or other dangerous communicable disease, other than those specified in Rules 1 and 2, will be received for transportation when such body is placed in a hermetically sealed case or air-tight metal-lined box, and bandaged and wrapped as in Rule 2, but when the body has been prepared and thoroughly disinfected by one who is authorized and approved by the State health authorities the air-tight sealing may be dispensed with.

DR. BAKER: In Erysipelas, although a dangerous and communicable disease, I don't think we should insist on a metallic sealed case, but it seems as though the body ought to be wrapped.

DR. PROBST: The rules of our State Board of Health do not require isolation for Erysipelas, and that is the

case with the rules of the majority of the State Boards. I see no reason for recommending it for a dead body when we do not demand it for a living person.

MR. HOHENSCHUH: A body dead from Erysipelas should be disinfected on the surface and bandaged in cotton.

MR. PEARCE: If you go into that you should incorporate every eruptive disease.

DR. HURTY: All bodies dead from eruptive diseases should be wrapped in cotton. Let that point cover all eruptive diseases.

MR. BYRAM: What necessity is there of having three or four classes of dead bodies? Why not have two classes—those dead from contagious diseases and those dead from diseases not contagious or infectious or communicable?

MR. GUMMERE: Is there any objection to adding to that list "and all other eruptive diseases?"

MR. HOHENSCHUH: I move that we add to Class 2 "Erysipelas, and all other eruptive diseases not mentioned in Class 1."

DR. BAKER: If you are going to do that, I wouldn't have any third rule at all.

MR. SADD: I think that is a mistake. The diseases in Rule 2 are dangerous and extra hazardous. We have in Class 3 those minor cases.

THE CHAIRMAN: Dr. Baker's point is a good one, and that is also the idea expressed by Mr. Sadd, that there should be extra preparation of bodies dead of diseases of that class—eruptive diseases. Why not adopt that and transfer Erysipelas to the other class?

Thereupon Rule 3, as amended, was unanimously carried.

Mr. Hohenschuh then read Rule 4, modified as follows:

Rule 4. The bodies of persons dead from violence or of diseases that are not communicable, may be received for transportation to points that are reached within twenty-four hours after death. For distances requiring more than the above limit, the body must be enclosed in an air-tight metal lined casket, or case, unless such body has been previously prepared by one authorized and approved by the State health authorities.

DR. BAKER: Will that displace the present Rule 4?

MR. HOHENSCHUH: The eighteen-hour clause is displaced by the twenty-four-hour clause.

Thereupon Rule 4 was unanimously carried.

MR. HOHENSCHUH: I recommend the adoption of Rule 5 as it stands. Said rule reads as follows:

Rule 5. Every dead body must be accompanied by a person in charge, who must be provided with a ticket, and also present a full first class ticket, limited or unlimited, marked "corpse," and transit permit from Board of Health, or proper health authority, giving permission for the removal, and showing name of deceased, age, place of death, cause of death, whether of a contagious or infectious nature, the point to which it is to be shipped, medical attendant and name of undertaker. Although proper transportation and permits are presented, a corpse will not be accepted for transportation if fluids are escaping from the case, or it has become offensive in any degree.

On motion of Mr. Hohenschuh Rule 5 was unanimously adopted.

Thereupon Rules 6 and 7 were read as follows :

Rule 6. The box containing corpse must be plainly marked with paster, showing name of deceased, place of death, cause of death, the point to which it is to be shipped, number of transit permits issued in connection and name of person in charge of the remains. There must also be blank spaces at bottom of paster for station agent at initial point to fill in the form and number of passage ticket, where from, where to and route to destination of such ticket.

Rule 7. It is intended that no dead body shall be moved which may be the means of spreading disease; therefore, all disinterred bodies, dead from any disease or cause, will be treated as infectious and dangerous to the public health, and will not be accepted for transportation unless said removal has been approved by the State Board of Health, and which must first be approved by the Local Board of Health, wherein the body lies buried, including that to which it is to be consigned and the disinterred remains enclosed in a hermetically sealed (soldered) zinc, tin or copper-lined coffin or box encased in hermetically sealed (soldered) zinc, tin or copper cases. The approval of the State Board of Health for disinterment must be attached to the transit permit, in the absence of which agents will positively refuse to accept such corpses for transportation.

DR. BAKER: I would ask whether that is not a case for discipline of the local agents?

MR. QUICK: That rule is not uniform. It does not apply in Ontario. There is no rule in Ontario regarding that adopted by the government.

DR. BAKER: The Board of Health of the Province of Ontario is a member of the National Conference of the State Boards of Health. Michigan and Ohio have adopted these rules. I suppose the Canadian Provinces have adopted them also.

DR. BRYCE: They have, with the exception of certain classes of diseases which are prohibited from transportation. There is no reason why Rule 7 should not be adopted, and that does away with the necessity of changing it.

MR. CHRISTIAN: There was a question raised this morning as to the time when a body should be disinterred. Permission has to be had before you put a spade in the ground, whether it is a day or five years after the burial.

DR. HURTY: My idea is that this is an advisory body. We can advise our proceedings to the National Conference of Boards of Health through a committee. What do we want the National Conference to do?

DR. BAKER: Adopt the rules we have formulated.

DR. HURTY: Suppose they conflict with State laws?

MR. SHARER: If the rules adopted by us are found to be an improvement upon those now in force, and they can not be made operative until some State legislation is made relating to these matters, it will pave the way, and ultimately these rules will obtain.

THE CHAIRMAN: Yes, and they will then go back as recommendation to the several State Boards of Health and to the railroads, and an effort will be made to bring in the new order of things.

Thereupon Dr. Hurty read the following resolution:

Resolved, That the rules and regulations adopted by this Conference, relating to the transportation of dead bodies be transmitted to the National Conference of State Boards of Health, requesting their consideration, and if possible the approval and adoption of said rules; and that copies of said rules be sent to each of the State and Provincial Boards of Health asking for their consideration, approval and adoption if possible by the Conference of the State Boards of Health.

Also that said authorities be requested to urge on their State and Provincial Legislatures, or upon the States and Provinces any legislative action as shall make the uniform operation of these rules by the several railways in the United States and Canada possible.

That a committee of three be nominated by the Chairman, of which the Chairman shall be one, to finally prepare rules for preparing dead bodies, and that said committee transmit said rules to the National Conference.

Seconded by Dr. Bryce. Unanimously carried.

Committee—H. P. Dearing, Dr. J. N. Hurty, Dr. C. O. Probst.

Adjourned.

PREPARED BY R. M. SWEARINGEN, M. D., STATE HEALTH OFFICER OF
TEXAS, AUSTIN, TEXAS.

THE RELATION OF FEDERAL TO STATE QUARANTINE.

In 1892, when cholera started out on its pilgrimage of devastation, governments of all civilized countries inaugurated vigorous measures of protection against its invasion.

As a rule, when men, individually or collectively, do things under the inspiration of a panic, they do very unwise things; and when the danger has passed the folly of their acts become apparent.

The national Cholera fright of 1892 and 1893 painfully illustrates this general proposition. The Congress of the United States at that time enacted laws that would not, I verily believe, under ordinary circumstances, receive a moment's consideration. The quarantine act of February 15, 1893, confers upon the Treasurer of the United States government the power to set aside, at his option, the health laws and the health officers of any State, and authorizes the President of the United States to formulate rules and regulations in lieu of said laws, and to substitute Federal for State quarantine officers to enforce them ; it further imposes upon the Treasurer of the United States the duty of making rules for the guidance of State health officers.

Article Third of the act referred to directs that "the supervising-surgeon-general of the Marine Hospital Service shall, immediately after this act takes effect, examine the quarantine regulations of all the States and municipal Boards of Health, and shall, under the direction of the Secretary of the Treasury, co-operate with and aid State and municipal Boards of Health in the execution and enforcement of the rules and regulations of such Boards and in the execution and enforcement of the rules and regulations made by the Secretary of the Treasury to prevent the introduction of contagious or infectious diseases into the United States from foreign countries, and from one State or Territory into another," etc. And when said rules and regulations have been made they "shall be promulgated by the Secretary of the Treasury and enforced by the sanitary authorities of the States and municipalities where the State or municipal health authorities will undertake to execute and enforce them ;" but "if the State or municipal authorities shall fail or refuse to enforce the said rules and regulations the President shall execute and enforce the same, and shall adopt such measures as in his judgment may be necessary to prevent the introduction and spread of such disease, and may detail or appoint officers for that purpose."

When this remarkable enactment is stripped of its technical verbiage, in plain English it means that sovereign States can not be entrusted with the police regulations necessary to protect the public health, and that the federal government, with vastly superior knowledge, must stretch forth its mighty arms for our defense.

In this law there is no provision made for testing the merits of any controversy that might arise between State and federal authority, nor of deciding questions of com-

petency of any officer, nor for court-martial in case of charges of incompetence or neglect of duty; no civil service examinations, no tribunal before which shall be determined the grave question of setting aside the laws of a State. It depends solely upon the opinion of the chief, and his opinion, upon the report of some inspector of the Marine Hospital Service, to the effect that the State rules are not satisfactory. What a parody on constitutional government. When one man, without even the form of a trial, can set aside the laws of a State, it is despotism, subversive of every principle of freedom and unworthy of the American people.

In order to have unmistakable evidence that the State health officials are complying with all the rules and regulations that have emanated from this great central source of sanitary knowledge, inspectors are sent all along the lines of coast quarantine at stated intervals, and many questions are asked, and the most minute investigation is made into everything pertaining to the administration of State quarantine.

Such surveillance will necessarily lead to complications and embarrassment, no matter how wisely the rules may have been formulated nor how discreetly they may be executed. An illustration recently occurred in my State. I received the following telegram:

WASHINGTON, D. C., July 19, 1897.

Dr. R. M. Swearigen, State Health Officer, Austin, Texas:

Dr. Magruder, Inspector of the Marine Hospital Service for Texas, reports location at Sabine Pass Station dangerous in the extreme. Fifty men working on wharf thirty yards from station; vessels from infected ports of Vera Cruz, Mexico, arriving. Can you place inspectors lower down? Immediate action necessary. Please wire.

Signed, WYMAN, Surgeon-General.

That telegram had an ominous meaning, a kind of portentous significance, well calculated to disturb the repose of even an old quarantine officer. Fortunately I had but a few days before the receipt of this startling information visited the station at Sabine Pass, and I was in position to know, and did know, as much about the situation as did Dr. Magruder, and I can assure this Conference that I had not felt a single ripple of apprehension. Dr. A. N. Perkins, the State quarantine officer in charge of the station, has served there fifteen years, and is thoroughly familiar with all of the duties of the position. He is strictly competent, fearless and vigilant. When ships arrive from inter-

dicted places they are carefully inspected, and if any real danger exists the most complete isolation is enforced. When no danger is apprehended he tries, in the interests of the commerce, to make the burdens of quarantine as light on sailors and shipowners as can be done consistently with good discipline, but he takes no risks or chances.

In order to throw the lights on this very dangerous condition of things it will be necessary to give a little unwritten history. The lesson will not be lost, as it brings out very clearly the advantage of knowing real dangers from imaginary ones, and shows how easy it is for those unacquainted with local interest to be misinformed and misled.

Sabine Pass is a small village at the mouth of the Sabine river, the dividing line between Louisiana and Texas. It has been for a number of years a lumber shipping point of some importance. Within the last year or two the channel has been deepened to a depth of twenty-three feet of water, and the trade has greatly increased. The quiet little village has been converted into a bustling town with limitless possibilities. The Kountz Brothers of New York, a wealthy firm, have bought up nearly all of the river front near the mouth of the river, and are building a new town, to be called by the euphonious name of "Kountzville," in honor of its great founders. These brothers are having cut water-slits or docks, to be leased to private parties or corporations for exclusive privileges, where railway trains can be run alongside the docks, and discharge or receive freight direct from the ships. One of these docks or basins is excavated within fifty yards of the present State quarantine station, and it has been done within the last few months. The owners could just as easily have made the excavation half a mile from the station, but it was planned at that particular place, I believe, for the specific purpose of forcing the State to move her station. As the State occupied land claimed by the Kountz brothers, there was no alternative. But it required time to secure an appropriation from the Legislature, and more time to get a permit from the Secretary of War for making permanent improvements on the main channel of a port of entry. The enterprise was pushed with great earnestness by the State health officer of Texas, but not fast enough for the enterprising town builders. The dock referred to as being near the station had been rented, I was informed, to a large lumber company of Beaumont, for some \$500 per month; but the said lumber company will not commence operations until the

quarantine station is removed. Of course, \$500 a month is a very important consideration, and the anxiety to secure it made the owners very impatient and desirous to have a new station. It fact, all at once they became fearfully apprehensive that a Yellow Fever epidemic would strike this enterprising community, if the station were not removed instanter. To accelerate my slow movements and hasten the removal of the station to another point, they appealed to the Marine Hospital Service, and an inspector from that department has been assigned to the special duty of watching that port, and the new town has the rare distinction of having her health interests guarded by representatives of both State and National governments.

Let us pause here and analyze the meaning of the expression "State and Nation," and endeavor to arrive at some conclusion as to the rightful jurisdiction of these respective officers. Judge Cooley tells us that "a state is a society of men, united together for the purpose of promoting their mutual safety. In American Constitutional Law the word 'State' is applied to the several members of the American Union; while the word 'Nation' is applied to the whole body of the people embraced within the jurisdiction of the federal government. 'Sovereignty,' as applied to States, imports the absolute, supreme power by which any State is governed. There is a division, however, of the powers of sovereignty between the National and the State governments, by *subjects*. The former being possessed of supreme, absolute and uncontrollable power over certain subjects throughout all the States and Territories; while the States have like complete power, within their limits, *over other subjects*. The *Constitution* is the fundamental law of a State or Nation, and it must regulate this division of sovereign powers."

The Declaration of Independence made every State a sovereign and independent State, and individual States at first assumed and performed all the functions of government. It required but a few years to demonstrate the necessity of limitations of authority between States and between the States and the general government. The Congress of 1775 and 1776 was strictly a revolutionary body, and like all revolutionary bodies its authority was undefined. As the exigencies of occasions evolved the need of changes in the original articles of confederation, the changes have been made, and the friction between the National and State systems of government has been harmoni-

ously adjusted. There has always been a strong party clamoring for a greater centralization of power at the National Capital, but the old doctrine of State sovereignty that had its birth in the organization of the federal compact is still adhered to by the majority of States, and the dignity of statehood asserted and maintained. Now, jurisdictions are defined and rights are fixed. Among the exclusive rights thus fixed, and heretofore sedulously guarded, no single right has a firmer hold upon the people than the right to protect their health and lives by local self-government. The officers of the State should be the custodians of the public health of each State, and the assumption, on the part of the federal authorities, that a surveillance by their inspectors is necessary, not only violates the constitution of the United States but it is tantamount to a declaration that the State officials can not be entrusted with so important a function.

Judge Cooley, in his "Constitutional Limitations," weighed with much ability and deliberation these fine points of governmental policy; and his interpretation is the recognized authority. On page 575 of that work he says: "In the general police powers of a State, persons and property are subjected to all kinds of restraints and burdens, in order to secure the general comfort, health and prosperity." "In the American Constitutional system, the power to establish the ordinary regulations of police has been left with the individual States, and can not be assumed by the National government." "Neither can the National government, through any of its departments or officers, assume supervision of the police regulations of the States, so long as they do not invade the sphere of National sovereignty, and impede the exercise of any authority which the constitution has confided to the Nation."

"Numerous illustrations," he adds, "might be given of the power of States to make regulations affecting commerce, which is sustainable as regulations of police." "Among these are *quarantine regulations and health laws*."

Allow me to repeat one paragraph from this great jurist: "Neither can the National government, through any of its departments or officers, assume any supervision of the police regulations of the States."

It would be interesting to learn how the expounders of the constitution can reconcile this clause, prohibiting the supervision of police regulations by the National government over States, with article 3 of the act of 1893, direct-

ing the Supervising Surgeon-General, immediately after the act takes effect, to examine the quarantine laws of all the States, and to do precisely what the Constitution says he shall not do.

Without considering the question of reserved rights, and constitutional inhibitions, it seems, from the very nature of things, that public health could be more satisfactorily protected by the State authorities than by other organizations, beyond the State's limits.

Officers are responsible to their constituents, and must render an account of their stewardship to them. The endorsements and approvals of the people for all public service is the incentive for faithful performances, and the rewards for duties done. The surgeon-general of the Marine Hospital Service, in his office at Washington, can not feel the responsibilities, as would the chief health officer of any State; nor could the people of any State have an opportunity to show their approval or disapproval of his official acts.

The only argument brought in support of the proposition to relegate the whole matter of quarantine protection to the general government is, that it would be a saving to the State, inasmuch as a border State, keeping up coast quarantine, is paying for the protection given the interior States incidentally. Those who advocate this measure on this ground certainly take a superficial view of the subject. An appropriation by the Legislature of a State for these expenses is more tangible and apparent to the casual observer; but a moment's reflection will satisfy any thoughtful man that one State will not lift the burden of taxation from another State by bearing her quarantine expenses, and that each individual State must, either directly or indirectly, through the tariff system, bear its *pro rata* share of the government cost. Regarding the question from an economic standpoint, it is fair to assume that the people of a State can select officers as much imbued with patriotic interests, and as fully informed on the subject of economy as would be representatives of the federal government.

In conclusion I beg leave to say, that this paper was not written for the purpose of criticising the management of the Marine Hospital Service, but to review the law as enacted in 1893, and to show its defects. That law ought to be repealed, or materially changed. It violates the Constitution of the United States, and insults the dignity of sovereign States, by forcing a surveillance upon them that must be as

distasteful to gentlemen who execute it, as it is humiliating to those who are compelled to submit to it.

I deem it especially incumbent upon this Conference to consider and take action upon these great questions. We are confronted by a growing power that threatens to monopolize all sanitary matters and control all systems of public health. The evolution of the Marine Hospital Service within a few years from a charitable institution, caring only for sick sailors, into a vast machine of power, is one of the marvels of the century; and unless a halt is called, it foreshadows, at no distant date, the doom of all State and municipal quarantines.

DR. U. O. B. WINGATE, Milwaukee, Wis.: I did not know until last evening that I was expected to open this discussion, and I have had no opportunity to study the question. Living in the northern part of our country, this question does not come up for consideration very often. I certainly agree with the reader of the paper regarding the unconstitutionality of the law of 1893, and believe it should be repealed. I do not wish to criticise the Marine Hospital Service or its management, but its powers now are such as to create a great deal of disturbance, especially in matters relating to quarantine. I do not feel competent, however, to discuss this matter this morning, and will give way to some one who is better posted.

DR. G. FARRAR PATTON, Louisiana: I think I can point with pride to the quarantine system in our State. We have been very successful in our efforts, and thus far there has been no attempt on the part of the U. S. Marine Hospital Service to interfere with the operation of our quarantine stations, for the simple reason that they are not only not open to criticism, but they have been taken as models for stations in various parts of the country.

So far as the constitutional features of the question are concerned, they were very ably handled by the reader of the paper. I might cite, however, the case of our State against two steamship companies, the Southern Pacific and Cromwell lines, which occurred a few years ago, in which the right of the state to establish quarantine and collect inspection fees was taken to the supreme court. That law-suit grew out of an injunction taken by those wealthy and powerful corporations to resist the right of the State to inspect their vessels. They claimed exemption from payment of inspection fees under that provision in the Constitution which forbids a tax on tonnage. They consented, however, to

pay these fees when their vessels arrived at quarantine between the hours of sunset and sunrise, for the reason that they would rather pay than submit to delay. This law-suit was pending for some fifteen years, and finally it was decided that it was entirely within the province of the State of Louisiana to protect itself by quarantine, and that in so doing it was simply exercising a power which the Constitution did not aim to take away from the individual States. That was decided by the Supreme Court of the United States.

Now, our relations with the Marine Hospital Service are fairly cordial. They have gone through the formality of visiting our quarantine stations once a year, and have expressed themselves as being entirely satisfied, so we have no need to complain of undue infringement upon the rights of our State.

DR. FELIX FORMENTO, New Orleans, Louisiana: I will add but a very few words to what has been said. I think the law of reason and the law of justice combine to establish the fact, that the State is in a better condition to protect itself than is the general government. The State certainly is more interested in the lives of its citizens than any foreign power, and to a certain extent, in these matters, that is what the general government is. The local authorities are well posted on the needs of the localities in which they reside, and it is greatly to their interest to protect the section of the State under their control. Certainly it seems but just that the State should have entire management of its local affairs, and this question has been settled once by law. It is right and proper that it should have this power.

To protect ourselves is our first duty. Our relations with the Marine Hospital Service are friendly rather than otherwise. We have no complaint to make, and they have no complaint to make of us, because we come up to their standard, or, rather, they have adopted our standard.

On the other hand, I think there should be central power for public health, call it what you will, a National Board of Health, Marine Hospital Service, or anything else. This board should be advisory to the State Boards, and in emergencies might take radical measures for the protection of our country if the State is not willing and has not the means to protect it. If the National Board should only act in an advisory capacity, a Central Board of Health would be valuable in many ways, especially in the gathering of statistics from all sections of a country and from all parts

of the world. In this way it could keep the State Boards well posted as to the prevalence of epidemics, etc., in different parts of the world.

DR. J. N. McCORMACK, Kentucky: This has been a very interesting subject to me, and it is certainly a very practical one. The difficulties in getting rid of legislation are very great. These difficulties will be particularly great in this case, inasmuch as my personal friend, the chief of this bureau, Dr. Wyman, is, as his successor was before him, an able lobbyist. He is right there at Washington, in receipt of a good salary, and being on the ground, is able to defeat any adverse legislation which may be proposed. It seems to me, if the gentlemen are right in regard to the law of this question, that it would be simpler and easier for Dr. Swearingen, when opportunity offers, to institute proper proceedings in court to determine the questions once for all. If the Marine Hospital Service is violating the Constitution, as it has been claimed here, the constitutionality of their acts certainly should be determined. There is a very great danger to State and Local Boards if the Marine Hospital Service extends its authority much further. This service consists of a lot of aggressive young men who were originally selected to administer to the wants of a lot of sick seamen. They have been self-seeking, pushing and aggressive, until now their power is almost limitless. The only way to get that law repealed, in my opinion, is by means of proceedings taken in court and carried to the United States Supreme Court. It would be a very hard matter to get Congress to repeal it. Representatives are not generally very much interested in these matters, and you will have hard work to get them to listen to you.

I might say in this connection that in 1892 I had the honor to serve on a quarantine commission created for the purpose of inspecting quarantine stations on the coast. We made inspections from Quebec to as far south as Washington City. In the judgment of the commission one of the worst stations we inspected was that of Delaware Breakwater. This was one of the stations of the Marine Hospital Service. There was nothing more there than a quarantine station on paper; and if that was a fair sample of the work being done by this Service, it certainly offers very little protection to the country at large, and demands very careful examination at the hands of State and Local Boards of Health. The men in charge of this station were physicians, very excellent men, but had neither the training nor

the fitness for the work they were there to do. They had neither the special qualifications nor the special training and education. I say these things with some reluctance, because my very good friend, Dr. Wyman, considers himself a very great and capable quarantine officer and authority, as did also Dr. Hamilton, his predecessor. It seems to me, in the quarantine department of the Marine Hospital Service, there are a lot of energetic, pushing young men who may be good physicians and good surgeons, but who have never had any particular training which would entitle them to be the guardian of the training health of this great country.

DR. H. M. BRACKEN: This paper is a very interesting one, but it appears to me very much like a trial with the defendant left out. It seems as if the Marine Hospital Service was on trial here. I think the proper place for this paper to be read would be before the American Public Health Association, as the Marine Hospital Service has a representation in that body.

DR. SWEARINGEN: Dr. Wyman received an invitation to be present at this meeting.

DR. H. M. BRACKEN: I think this is a question which should be fully discussed. The State Boards of Health, the Local Boards of Health and the National Body certainly should work in harmony instead of drifting farther and farther apart.

As I understand the law it says that the State Boards should do so and so, and if they do not do so and so then the Federal government should do so and so. I believe this to be just regulation. It serves to protect the whole country. You in Louisiana may have no trouble in protecting your State. You are protecting, to a certain extent, the entire Mississippi Valley. But if you do not protect your State the country would not be protected, and the general government would be justified in stepping in and establishing a quarantine.

REPORT OF THE COMMITTEE APPOINTED TO REPORT UPON VACCINE VIRUS.

The committee appointed for the purpose of ascertaining the conditions under which vaccine virus was produced and dispensed in the United States reported at the last meeting at Chicago upon the work done up to that time. The committee was continued and now has to report as follows:

The previous report treated of the various farms visited by the members of the committee, the conditions found at the various farms and the methods of preserving and dispensing the virus. Recommendations were

also submitted concerning the desirability of certain methods and precautions being exercised in the manufacture of this article.

The report upon the farms was received, but it was not thought desirable by the Association at that time to indorse, in the name of the Association, any requirements, and that it would not be desirable to recommend any particular producer, for the reason that the Association could not properly assume the responsibility of recommending and controlling any or all of the producers. It was considered as desirable that each State Board of Health in whose State such farms existed should have an oversight of the farms and that they should, by legislative action, have control of the methods employed, making such requirements as would be necessary for producing a virus practically free from extraneous matter.

Since that report was made, a most extensive examination of all the farms has been made by Dr. Robert L. Pittfield, Assistant Bacteriologist, State Board of Health of Pennsylvania, appointed by and under the supervision of the Associated Health Authorities of Pennsylvania, the State Board of Health of Pennsylvania. This investigation was most thoroughly made, and an exhaustive consideration was given in every detail connected with production of the virus.

Many farms were examined which had not been available to your committee. This report also gave, without reserve, unfavorable comments upon the various methods found, when in the opinion of the committee it was deemed applicable. Much commendation should be given to the instigators of this report as well as to the inspectors for the thoroughness of the work.

As this report is to be obtained in full in the issue of the *Public Health*, a quarterly journal of the Boards of Health of Pennsylvania, your committee will merely submit a tabulated summary of the results and conclusions made by that committee.

NAME OF FARM.	PRODUCERS.	SUMMARY OF CONCLUSIONS.
Franklin Co. Vac. Farm ..	Dr. Seibert	Dirty and careless.
Jenner Vaccine Farm	Dr. Suisseerot, Chambersburg.	Dust and lack of cleanliness of hands and instruments.
Pennsylvania Vac. Co.....	M. McKnight&Co.	Hay dust; tuberculin not used; filthy racks.
Lancaster Co. Vac. Farm ..	Dr. H. M. Alexander & Co ..	Admirable establishment; tuberculin used.
National Vaccine Estab.	Dr. Ralph Walsh & Dr. Elgin	Cleanly but no tuberculin used.
Chicago Vaccine Stables ..	Dr. E. A. Wood ..	No veterinary control; cattle obtained from the stock yards.
The Vaccine Farm of Mess. Codman & Shurtliff ..	..	Pus layer used on points.
Codman & Shurtleff	leff, Dr. Rose, Sup't	
Dr. F.C. Martin Vac. Farm.	Dr. F. C. Martin ..	Dusty ceiling; no tuberculin used; points handled; old pre-antiseptic methods.
New England Vaccine Co ..	Dr. Cutler & Dr. Frisbie	Points handled.
The Missouri Vac. Farm ..	Dr. R. M. Higgins ..	Crusts used for seeding purpose; pus layer used; no tuberculin; points handled.
Columbia Vaccine Farm ..	D. D. Moss, Boone Co., Mo.....	Dusty operating rooms; no tuberculin; scarcity of water.
The Fon Du Lac Vac. Co ..	Dr. E. B. Beeson ..	First class establishment; no tuberculin used; Tuberculosis rare in this district; one of the best farms visited.

NAME OF FARM.	PRODUCERS.	SUMMARY OF CONCLUSIONS.
The Dr. McNeel Co.....	Dr. Henry McNeel, Calves vaccinated in the stable; no tuberculin; good asepsis.	
The Dr. W. H. Welker Dr. Welker, Tru- Vaccine Co.....	Excellent establishment; too ax, Greene & Co. large scarifications on calves	
Bowker Vaccine Farm.....	Bowker, Boston.	Not accessible.
N.Y. City Board of Health.		Inspected but not reported.

The committee is in receipt of a report on the State Vaccine Laboratory connected with the university at Champaign, Ill. The report is made by Dr. Charles B. Johnson and a member of the State Board of Health, and a resident of Champaign. The report is herewith presented. It is to be regretted that the committee of inspection which has made a report upon the other farms could not have inspected this farm for the purpose of observing in detail the comparison of this with the others.

REPORT ON THE STATE VACCINE LABORATORY, BY CHARLES B. JOHNSON, M. D., CHAMPAIGN, ILL.*

"On the 1st day of July, 1895, a legislative act went in force, appropriating \$3,000 'for the purpose of establishing, equipping and maintaining a laboratory in connection with the State University at Champaign for the propagation of pure vaccine virus.' Some of the results of this legislation it is my purpose to embody in a report to the Illinois State Medical Society at this time.

"The State vaccine laboratory is located on the grounds of the University of Illinois, about one-fourth mile distant from the main university building. The laboratory is a one-story frame structure, consisting of a main building, fronting the east, 18 x 34, and attached to this and extending to the west, a wing 13 x 36. In all besides a number of conveniently located closets, the building contains six rooms. These are, respectively, a reception room and office, and in the rear of this a dressing room and lavatory, 8 x 14 (also a closet, 6 x 8) and an operating room, 14 x 18, all in the main building. In the wing are the vachery, store and feed room, and last the detention room.

"Through the front door you enter the reception room or office and from this pass by one door into the dressing room and lavatory. By another door you pass from the offices to the operating room. In the operating room, besides the door opening into the office, is one opening into the lavatory and another opening into the vachery. From the vachery a door leads into the feed and store room and from the latter another door opens into the detention room. Both the detention and store rooms have outside doors. The laboratory building is isolated and its sanitary relations are as favorable as possible. All the rooms are well lighted and ventilated, all the windows and doors are screened and the whole of the wood work about the building is thoroughly painted and carefully kept in that condition.

"The operating room occupies the north end of the main building, its walls and ceilings are made of rock plaster, well painted, and three large windows supply an abundance of light. Near the center of this room is a strong, well-made table, so constructed that its upper surface can be tilted to an upright position so that when an animal is led alongside and strapped to this surface, the top of the operating table, the latter is easily thrown back to the horizontal plane, carrying with it the heifer that is thus secured upon its side ready for the inoculator. At one side of the room and convenient to the operating table is an instrument table, sink, filter, hot and cold water faucets and vessels for containing sterilized water and antiseptic solutions. Attached to one of the walls is a cupboard for storing frames stocked with vaccine points. In the lavatory is a stove to which is attached a range boiler of twenty-five gallons capacity for heating water.

*Read by title at the recent meeting of the Illinois State Medical Society at East St. Louis and referred to Committee on Publication.

"Next to the operating room and opening out of it is the vachery, where are kept the heifers immediately after inoculation. This room has a cemented floor, and for a distance of four feet above this the walls are made of glazed brick, while the remainder of the wall, together with the ceiling, are made of rock plaster well painted. The floors of both the vachery and operating rooms are so constructed and provided with drains that they can be flushed with either hot or cold water. Between the vachery and operating room is a large flue, and connected with this is a crematory for consuming refuse matter. It goes without saying that in the operating room the instruments, vessels, tables, towels, etc., are clean and aseptic. Indeed, it is not too much to say that everything about the lavatory is kept in a state of almost ideal cleanliness.

"For inoculation, healthy heifers, calves of exceptionally good ancestry, and from six weeks to four months old, are carefully selected from herds known to be especially desirable. But, however healthy these may seem, as one of the final tests the temperature of the animal is taken and if this exceeds the normal (about 102° F.) the heifer is rejected. After the animal is secured upon the operating table the abdomen and adjacent parts are thoroughly scrubbed with soap and water. Next, from the posterior part of the abdomen, the hair is clipped. Then these parts are well lathered and shaved. Finally the newly exposed cuticle of the animal is well washed with sterilized water and thoroughly dried with sterilized towels. This done, the operator, with a bistoury, denudes a number of points about the size of a quarter of a dollar on the prepared surface. Next these are inoculated with fresh vaccine lymph, after which the heifer is freed from her confinement on the operating table and taken to the vachery near by, where her head is secured in stanchions, thus preventing any disturbance of the points of inoculation.

"On the sixth or seventh day the animal is again taken to the operating room and secured upon the table, when, after being well washed in an anti-septic solution, the scabs are removed and the lymph collected as it exudes. By their blunt ends, ivory points are fastened in a frame about eighteen inches long, and, thus secured, are easily handled in the aggregate by the operator, who with a camel's hair brush or glass rod collects the lymph as it exudes and thoroughly coats the points. After they are well dried the points are put in tin boxes, ready for shipment. All the lymph collected, the animal is taken to the detention room and kept there for about fifteen days before being set at liberty.

"A specimen of lymph from each animal is examined bacteriologically for the detection of possible presence of streptococcus, staphylococcus or other dangerous micro-organisms. The quality of lymph is further tested by from time to time inoculating with it, guinea pigs, rabbits, etc. An abundant supply of these animals for experimental purposes is found in a rabbit warren conveniently near the laboratory.

"As time progresses, those in charge of the State vaccine laboratory have it in mind to devote some time to original research along the lines that the laboratory was designed to follow. The bacteriological work of the laboratory is under the supervision of T. J. Burrill, Ph. D., and the operative and practical work is in immediate charge of Donald McIntosh, D. V. S., both of the University of Illinois."

No report of an inspection has been found as made by this committee of the Minnesota Vaccine Farm, conducted by Dr. Hewitt, but of which a report was submitted by your committee last year.

It would appear by reference to this table that there were but four establishments which the committee felt justified in passing upon without unfavorable criticism. These were the Lancaster Vaccine Farm of Alexander & Co., the Fon Du Lac Vaccine Co., conducted by Dr. E. B. Beeson; the Dr. W. H. Welker Vaccine Co., of Milwaukee, Wis., conducted by Dr. Welker, and for whom Traux, Greene & Co. are the agents for the dispensation to the trade, and the National Vaccine Co.

But two of the farms required the use of tuberculin as a test for the exclusion of Tuberculosis in the calves. These were the Lancaster Co. and

the Welker Co. At two farms the animals were killed to ascertain the absence of disease before the points were placed on the market. While the probabilities are that no calf, having hereditary Tuberculosis, would live long enough to reach the age desirable for vaccination, yet every source of danger from any disease should be eradicated as far as possible.

As this report is given as the result of close inspection of each farm, and by responsible authority unbiased by any commercial considerations, it would seem as if those who are about to use vaccine virus would be justified in accepting the product of those farms which have the indorsement of this inspection. Whatever may be the good intentions and the practice of the various farms, it is well known, however, to those who have occasion to use small quantities of virus at irregular times that the average percentage of sore arms, and of failures to produce typical vesicle, are sufficiently frequent to bring upon the person using the virus censure and mortification.

As a result of a bacteriological examination of the various points and liquid products found upon the market, the committee submitted the following tables as showing the comparative sepsis of the materials which we are requested to purchase :

REPORT ON NUMBER OF BACTERIA PER POINT GROWN ON GELATINE AND AGAR-AGAR.

<i>Name.</i>	<i>Gelatine.</i>	<i>Agar.</i>
Lancaster County Vaccine Farms.....	175	175
Columbia Vaccine Co.....	375	625
Dr. Henry McNeel Co.....	400	320
Codman & Shurtliff	412	Not estimated.
Fond du Lac Vaccine Co.....	500	75
Chicago Vaccine Stables.....	550	125
New England Vaccine Co.....	1,225	75
Jenner Vaccine Farm.....	2,510	1,400
Pennsylvania Vaccine Co.....	3,700	350
Dr. E. M. Bowker.....	6,200	1,000
Dr. F. C. Martin Vaccine Farm.....	9,600	375
The National Union Vaccine Co.....	10,025	175
National Vaccine Establishment.....	84,050	875
Missouri Vaccine Farm.....	294,025	9,825

EXAMINATION OF FLUID LYMPH, NUMBER OF BACTERIA PER DROP.

Dr. H. M. Alexander & Co.....	0
Dr. E. B. Beeson,	
N. Y. Biological and Vaccine Institute }.....	2
Chicago Vaccine Stables, }	
New England Vaccine Farm }.....	3
National Vaccine Establishment.....	6
Missouri Vaccine Farm	8
Dr. H. Welker's.....	10
Dr. J. Pettet's.....	92

The number of bacteria depends largely upon the age of the lymph and the quantity of glycerine which is added to it.

While the theory of sepsis and antisepsis is necessary in the consideration of the production of vaccine virus, since it is from neglect of the details that we are presented with sore arms and the introduction of tetanus and other septic bacteria, yet with all the chances in favor of the introduction of these various organisms, the results show that either the producers are fortunate or that the human system has greater power to resist the entrance of pathogenic bacteria than we have supposed.

For the purpose of finding out the practical application of a theory that one or another producer presented better or worse opportunities for infection of their products, your committee has made inquiry of the various cities where virus was in use to ascertain the actual results obtained by each user by vaccination with the various products.

The following circular was therefore sent to the various health officers and commissioners, together with the accompanying list of questions:

"July 26, 1897.

"DEAR DOCTOR—At the meeting of the National Conference of State Boards of Health held in Chicago last year, a committee appointed for that purpose reported the conditions of the various vaccine farms in the United States, with a view of ascertaining the methods pursued by the various producers of vaccine virus and to recommend some line of requirements which would be considered desirable in such propagation.

"Since then an exhaustive report of inspections of all the farms in the United States has been made by a committee connected with and working under the State Board of Health of Pennsylvania. The conditions found were frankly reported, and it was concluded that there were but few of these farms which made any endeavor to prevent the ingress of extraneous matter, blood and pus, into the material produced.

"It is now the desire of the committee of the National Conference to ascertain the results of the use of the product coming from these different farms, especially from those producing the most of the output.

"Any untoward results should be known not only for avoidance on the part of health officers who are called upon to recommend the use of some desirable virus, but also such knowledge acts to benefit producers who are desirous of improving their methods in every possible way, but not knowing of any bad results are satisfied that they are doing the best they can.

"If I might impose upon your valuable time and kindness in filling out answers to the accompanying questions you will be doing a service to the committee and to health officers in general, and will greatly oblige and assist,

Yours gratefully (in advance),

"GARDNER T. SWARTS, *Chairman.*"

1. What makes of vaccine virus are used in your city?
2. Are points, crusts or liquid virus used?
3. Is humanized virus used at all by your Board?
4. Can you give the number of points used by your Board from the different sources during one year?
5. Do the points used produce typical vesicles?
6. Have you noted any disagreeable results from the use of any of the different makes?
7. Does your Board assume the responsibility of recommending or _____ virus?

The health officers of the following cities were kind enough to reply: Albany, N. Y.; Columbus, O.; Cambridge, Mass.; Chicago, Ill.; Detroit, Mich.; Denver, Colo.; Fall River, Mass.; Hartford, Conn.; Haverhill, Mass.; Knoxville, Tenn.; Lowell, Mass.; Lynn, Mass.; Macon, Georgia; Memphis, Tenn.; Minneapolis, Minn.; Manchester, N. H.; Melrose, Mass.; New York City; Newton, Mass.; Nashville, Tenn.; New Bedford, Mass.; Paterson, N. J.; Philadelphia, Pa.; Pittsburgh, Pa.; Portland, Me.; Richmond, Va.; Raleigh, N. C.; Salem, Mass.; San Antonio, Tex.; St. Louis, Mo.; St. Paul, Minn.; Toledo, O.; Utica, N. Y.; Yonkers, N. Y., and Youngstown, O.

The object of the first question was to ascertain which of the various products was most sought for, since the use of a particular virus is dependent upon the favorable experiences which the user has had or from the reports of successes by his fellow health officers. The following will give the condensation of the answers received and make it possible for correspondence with other cities using the same or other virus.

	1.	2.	3.	4.	5.	6.	7.
Albany, N. Y.	Welker ... N. Y. National. T. W. Wood. Oakland. Cook Co., Ill. N. E. Martin ...	Lic. Lic.	0 0	200 M. 194 5 M. 198	+	0 0	+
Columbus, O.	P	0	100	0	0	0	0
Cambridge, Mass.	P	0	300	+	0	0	0
Chicago, Ill.	P	{ 100,189 in. 36	{	+	0	+	{ Schools compulsory — not for private use.
Detroit, Mich.	Lic.	Never	.....	{	+	+	{ Poor Comm. phys. will not use lic. Take too long.
Denver, Colo.	F	0	{ 142 in. 96	{	Lic. tbs.	frn. pts.	Furnishing virus.
Fall River, Mass.	P	0	2,500	+	0	0	{ Used, because most likely to “take,” but sometimes sore crust, deep ulcers and general eruption.
Hartford, Conn.	P	0	0	+	0	0	
Haverhill, Mass.	N. E.	P	0	250	Mostly	+	
Knoxville, Tenn.	Alex. Fon du Lac. Alex. N. E. Alex. Martin ... N. E. National.	P P P P P P P P	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	++	Not often	0 0
Lowell, Mass.	Alex. N. E. Alex. Martin ... N. E. National.	P P P P P P	0 0 0 0 0 0	716 716 400 100 2,000	++ ++ + As a rule	0 0 0 0 0	Sometimes failures
Lynn, Mass.	Welker ...	F	0	?	+	0	0
Macon, Ga.	Welker ...	Lic.	0	0	+	0	0
Memphis, Tenn.	?	P	0	0	....	0	0
Minneapolis, Minn.	Martin ...	P	{ Never by any phys.	....	+	0	0
Manchester, N. H.		P	0	0	....	0	0
Melrose, Mass.	Martin ...	P	0	0	....	0	0

1.	2.	3.	4.	5.	6.	7.	
New York City.....	N. Y.....	{ Glycer. Vacc. Pulp. } 0	{ 129,214 July 1, '96-'97 } +	.....	..	{ Board uses and furnishes its own virus. }	
Newton, Mass.....	N. E. (83-4).....	P 0	{ '82,35 '94 } 0	?	?	0	
Nashville, Tenn.....	National.....	P 0	.....	0	0	+ { When ordered compulsory furnished. }	
New Bedford, Mass.....	Martin.....	P 0	600	+	0	0	
Paterson, N. J.....	N. Y.....	P 0	3 M-'95	+	0	0	
Philadelphia, Pa.....	Weller.....	P 0	5 M-'95	+	0	0	
Martin 15-20 yr.....	Weller.....	P 0	23 M-'95	+	0	+	
Pittsburg, Pa.....	N. E.	P 0	33 M-'95	+	0	+	
	National.....	P 0	300	{ As a rule }	0	+	
Richmond, Va.....	N. E.	P 0	0	+	0	+	
Raleigh, N. C.....	Martin.....	P 0	0	+	0	+	
Salem, Mass.....	Alex.....	P 0	*	No	0	+	
San Antonio, Tex.....	National.....	P 0	*	+	0	0	
St. Louis, Mo.....	N. E.	P 0	All school children	{ Sometimes sore arms }	0		
St. Paul, Minn.....	Higgins	P 0	120 M to 154	*			
	Hewitt	P 0	in '96	+ { No general vaccination for 15 years. }			
Toledo, O.....	Lic. 1	P 0	2,506	0	0	0	
Utica, N. Y.....	N. E.	P 0	+	0	0	0	
Yonkers, N. Y.....	{ N. Y. (formerly) Martin }	P & Lic. 0	.....	{ In some cases }	0	0	
Youngstown, O.....	Alex. and National	P 0	0	+ { 50 Lic. tubes during '96; equal results as points. }	0	0	

Naturally the State Boards of Health are seldom called upon to supply virus except in the presence of a statute existing which provides for the distribution of the virus. Consequently the Secretaries of State Boards are not as familiar with the products which are being used in their respective States as would seem desirable, they having more direct knowledge of the producers and their methods.

Of the thirty-three cities from which replies were received six were using the New England Vaccine Company's product exclusively, while nine others were using it in conjunction with other makes. Two were supplied by the New York City product alone and five others were using it with other makes. The three who were using Welker's were not using anything else. The Higgins Vaccine Farm supplied two cities. Three were supplied by Martin exclusively, while six others used it in combination. Alexander supplied one exclusively and six others in combination. The Fon Du Lac supplied one, in combination with the Hewitt and others. While these farms probably are supplying many other cities and foreign countries, as the producers report the exportation of their product to South America and other foreign countries, yet this report gives a fair proportion of the cities in the United States using the products of the farms.

While the proportion of judgments as to the desirability of one over another product may be shown by comparison of the number of consumers, yet it should be borne in mind that the number of points used by some of these cities is comparatively small as compared with other cities, and hence the opportunity for bad results are reduced to a minimum. The number of points used, therefore, should be taken into consideration. For example, the city of Albany, using Welker's liquid virus, as well as the New York city virus, consumed 200,000 points in 1894 and 5,000 points in 1896. The city of New York used 129,214 of their own manufacture during the past year. Paterson, N. J., used 5,000 including the New York city, Alexander's and Welker's virus. Pittsburg used 6,669 of the New England Vaccine Company; St. Paul, Minn., 2,500 from the Hewitt farm; St. Louis 125,000 from the Higgins Farm in Missouri, and Chicago 109,000 from the Welker farm.

As will be seen by the accompanying table that all the consumers were unanimous in stating that typical vesicles were produced, and in but one or two instances were there any complaint that the vaccination produced any disagreeable effects. A few reported that in some instances for brief periods some of the points from the *different farms* failed to take, and in few instances sore arms were produced. This is perhaps the experience of every user of this material, no matter from what source it is derived. It may mean one of two things. Either the virus had been gathered carelessly by a new operator or from a more than unusually dirty animal, allowing pathogenic bacteria to enter at the time of charging the points, or it may mean that the true and uninfected vesicle becomes broken by violence on the part of the patient, and the serum of the vesicle proving to be a most desirable nutrient media and under the favorable condition of heat the streptococci or pus bacteria, being omnipresent upon the skin of man and in the dust of his clothing, find their way into the vesicle, which being crusted after the oozing of the serum, retains the organism beneath the crust, where they increase and multiply with the accompanying toxic effect leading to symptoms of swelling, heat and redness, and which, being neglected, permits of the burrowing and erosion of the skin by the continued action of the bacteria and their products, and we have the so-called "sore arm," the "blood poisoning" and the deep ulcer, with the resulting large, smooth, glassy cicatrix, leading one to doubt, not having seen the original vesicle, if the inoculation was successful.

That this latter condition of rupture of the vesicle and subsequent infection is the most common and probable cause is shown by the experience of the Superintendent of Health of Providence, Dr. C. V. Chapin. In his department it is the exception to use bovine virus. Humanized virus has

been used uninterruptedly for the past forty years; bovine virus being used only when requested by the applicant for vaccination. Under these conditions the possibility of introducing pathogenic bacteria from the numerous opportunities to be found in stables and coming from the hide and hair of the calf is absent and is reduced to only the chance of contamination from the bacteria to be found in a public operating vaccinating room or the home of the patient.

As the result of continued observation of these cases, Dr. Chapin has concluded that in his experience no bad arms result unless the vesicle is broken. When the vesicle is presented for inspection at the end of seven days there is no pustulation unless the vesicle shows the presence of rupture.

Of the thirty-three cities from which answers were received only one, Providence, R. I., reported that humanized virus was used. It is obviously impracticable for a commercial firm or State Board of Health to obtain sufficient virus of this character, and the general concensus of opinion of the various boards is against the use of humanized virus. While it may be free from the gross contaminations of pus producing infection, yet the probable chances, although shown to be very remote, of introducing any of the specific disease of man are too great to be ignored, and by the use of bovine virus the vaccinator is exonerated from any possibility of introducing these diseases.

That it is possible to obtain virus from calves free from pus bacteria is shown by the various bacteriological examinations made by various boards of health. There seems to be no reason why the bacteriological test should not be used by every producer before placing his wares upon the market. While some of the farms are under the control of competent bacteriologists, it has not been ascertained that a systematic examination is made of the various lots of material sent out upon the market by any of these farms.

That this is practicable is shown by the methods of procedure of the health department of the city of Chicago.

This city has had its various experiences with epidemics of Small-pox, during which periods large numbers of points have been used from various farms. Its yearly requirement reaches into the hundreds of thousands of vaccine tubes. It was as a result of these experiences which led the assistant commissioner of health to make a protest against the exposed ivory point method of vaccination, and the liquid vaccine hermetically sealed tubes were adopted.

To quote from the report of the department of health of that city:

"This fluid vaccine, since its adoption, has proved continuously to be bacteriologically pure and clinically successful, excellent results following in from ninety to ninety-seven (90-97) per cent. during its use. Each and every shipment receives thorough and careful testing before any of the material is used. Four visits have been made to the farm where it is prepared under the personal supervision of the proprietor, the surroundings have been determined by us to be eminently satisfactory, and our observations and examinations have demonstrated to us that the conditions under which every detail is conducted are governed by aseptic precautions. This vaccine is developed from the healthiest calves, from four (4) to six (6) weeks of age, and is put up in hermetically-sealed glass tubes, each tube containing a sufficient quantity for one operation. During the many years that I have been connected with the health department of this city, I have never found any vaccine that was so promptly and uniformly successful in producing typical results. I have noted in using this fluid vaccine a diminution of the usual inflammatory areola surrounding the vaccine vesicle, less constitutional disturbance, freedom from suppurating sores, inflamed glands and lymph vessels, etc., and it produces a more active and typical vesicle than occurs with virus dried upon an ivory or quill point, and the element of secondary or adventitious infection can, with simple precaution, be entirely eliminated."

As the methods adopted and carried out are so practical the liberty is

taken of quoting the report of the Bacteriologist of the Board, Dr. Adolph Gehrmann. The virus used is that obtained from the Welker farm, the local conditions of which have been given by the inspectors sent out by the Pennsylvania Boards. This farm was also visited by the chairman of your committee immediately after the adjournment of this association in Chicago last year, and the conditions found were as described by the Pennsylvania committee.

“GLYCERNIZED VACCINE.—Beginning with July, 1895, a systematic bacteriologic examination of vaccine used by the department was regularly undertaken by the city bacteriologist, at the suggestion of the assistant commissioner. This was necessitated because of the results obtained from tests that were made of ivory points in use and those on the market. In all of these bacteria of suppuration were found present in larger or lesser numbers. Some of the cultures showed as many of these bacteria as would be found in cultures made directly from pus from abscesses, while the clinical efficiency was shown to lessen rapidly where the ivory points, of the same lot, were used in a test extending over a period of time. Knowing from experience presented, and from literature, that glycerine exercises a decided preservative action upon vaccine, and at the same time greatly reduces the virulence of the bacteria, and in time entirely destroys their vitality, it was sought to obtain a liquid vaccine in glycerine in which the numbers of bacteria were reduced to the minimum, and at the same time one that had not deteriorated in vaccinal efficiency. The experiments that have been made since glycernized vaccine has been used by the department show that the period of contact of the pus bacteria with glycerine necessary to destroy their vitality is from fifty to sixty days. Some other bacteria, especially those containing spores, require much longer contact, as much as five months being required for some. The period of efficiency for glycernized vaccine that can be uniformly assured, as determined by primary vaccination experiments, is from 120 to 150 days. It has, therefore, been found to be most satisfactory to obtain and to use vaccine material in this form during the third and fourth month after it has been removed from the calf.

“It is now a definite provision that the vaccine delivered to the department for use shall be a sixty-day emulsion in glycerine, and it is so arranged in the department that the entire lot received can be completely used during the next thirty or forty days.

“From the accompanying tables an idea may be had as to the bacterial condition of the vaccine used. If upon examination of any colonies appearing upon the cultures, these are found to be species of pus bacteria, the vaccine is rejected. The occasional appearance of saprophytes, moulds or yeasts has not been deemed sufficient reason for condemning the lot. The method of examination consists in planting drops of the glycerine emulsion upon slant agar and spreading it out over the surface or into bouillon of ordinary composition. These tubes are cultivated in an incubator for two or three days, and the growth, should any make its appearance, is further examined by microscopic preparations or further cultures. In addition to this examination a second lot of tubes from each lot is examined for the *Bacillus tuberculosis* by staining, after the method of staining this bacillus in sputum. So far, however, it has been impossible to demonstrate the *Tuberculosis* in any of the specimens of vaccine received at the laboratory, either from the regular source of supply or from those samples which were delivered in competitive tests or for other purposes.

“The accompanying table of examinations will show the results of the examinations as made from the different lots of vaccine material received. Such a lot of vaccine consists of 5,000 tubes, each tube containing sufficient for a single vaccination, packed in boxes containing ten tubes each. From each lot ten boxes are selected from different parts of the lot of boxes as they occur in the original package. The examinations made January 26th, April 30th and June 1st illustrate very well the general character of the material, when it is accepted as satisfactory and ready for use. In addi-

tion to these, however, it may be said that ten tubes for clinical test are selected and are sent to the chief medical inspector, Dr. Garrott, for his part of the examination.

"The examination in the column marked 'September 9, 1896,' shows a series of cultures upon which no bacteria developed. This evidently was an old lot of vaccine and the clinical tests made at the same time were unsatisfactory, so that it was necessary to reject this particular lot. The examination of vaccine in the column marked 'September 19, 1896,' was from a lot of vaccine in which there had not been sufficient time for the glycerine to act upon the bacteria contained, and this lot was rejected because of the presence of pus bacteria and a large number of saprophytes.

"The last column, also marked 'September 19, 1896,' but upon which a re-examination was made November 3, 1896, was from the same vaccine in the ten boxes originally selected from this lot, and tested September 21, 1896, or fifty-three days after the first examination. It will at once be seen that the relative numbers of bacteria present of different kinds had decreased to such an extent that this lot of vaccine could have been used during November without any of the dangerous results that were possible from the material at the time the first examination was made. The lot had, however, been returned, and the examination was made simply to determine the result that would take place as the vaccine became older and more time was given for the action of the glycerine.

"In this table the sign of multiplication indicates growth, while the minus mark indicates that there was absence of growth, and the particular variety of organisms is indicated by the columns in which the marks occur."

In conclusion your committee would urge upon Health Boards the necessity of using and recommending the use of only such products of vaccine virus as are presented by farms which are known to take all the care in detail which was suggested in the previous report of last year, namely: the use of perfect asepsis and antisepsis in the inoculation of all animals, the collection of the serum only from the typical vesicle under the strictest antiseptic conditions, with avoidance of handling the points during this operation, the assurance of healthfulness in the animals and that they be proved free from Tuberculosis by the tuberculin test, and the use of only such virus as has from time to time been shown to be materially free from the presence of bacterial contamination.

Your committee would also suggest the advisability of interestate communication as to the results of material used in order that the practical results aside from laboratory experiments may be made available in making judgment or the selection of virus in the time of epidemic.

Upon motion, properly seconded, the report of the committee was accepted.

Vaccine received.....	January 24, 1896.	April 16, 1896.	June 1, 1896.	Sept. 9, 1896.	Sept. 19, 1896.	Sept. 21, 1896.	November 3, 1896.	Sept. 19, 1896.
Cultures made.....								
Specimen 1, a.....								
Specimen 1, b.....								
Specimen 2, a.....								
Specimen 2, b.....								
Specimen 3, a.....								
Specimen 3, b.....								
Specimen 4, a.....								
Specimen 4, b.....								
Specimen 5, a.....								
Specimen 5, b.....								
Specimen 6, a.....								
Specimen 6, b.....								
Specimen 7, a.....								
Specimen 7, b.....								
Specimen 8, a.....								
Specimen 8, b.....								
Specimen 9, a.....								
Specimen 9, b.....								
Specimen 10, a.....								
Specimen 10, b.....								

PROPOSED BY THE STATE BOARD OF HEALTH OF SOUTH CAROLINA :

"SHOULD COUNTY JAILS AND PRISONS OF THE DIFFERENT STATES BE PLACED UNDER THE SANITARY SUPERVISION OF OTHER REPRESENTATIVE STATE BOARDS OF HEALTH WHICH SHALL HAVE THEM INSPECTED REGULARLY AT STATED INTERVALS BY A HEALTH OFFICER APPOINTED BY THEM OR UNDER THEIR CONTROL?"

DR. W. J. McMURRAY, Tennessee: Mr. Chairman—The fact that I am expected to respond to this question reminds me of a story of a couple of negroes, one of whom was named Joe and the other Josh.

They went together into a store and Joe said to the clerk, "Boss, sell dis yere man a hat, and I'll pay for it."

"What kind of a hat?" asked the clerk.

"A two or three-dollar hat," replied the negro.

The clerk gave the hat to Josh, and after the negro had walked out of the store the clerk asked Joe why it was that he was buying a hat for Josh.

"Well, boss," replied Joe, "they tell me that two of Josh's children favor me very much and I feel kind of nigh unto Josh." That is the way it is with me in regard to the question of State prisons and jails.

Now, Mr. President, this is a very important question. It involves the unfortunate, it involves men who are deprived of their liberties and who have no voice as to the sanitary conditions by which they are surrounded. I think it is but just for a man to expect to be liberated in as sound a physical condition as he was at the time he was first imprisoned. But the idea of building jails and prisons in such a manner as to be conducive to the health of the inmates does not seem to have been much thought of by the architects of these buildings, and if these architects are considering this question to-day, it is a recent innovation. For instance, you might go to our penitentiary here, which was built in 1828, and you will find cells in which from two to four prisoners are confined, which are about six feet wide, fourteen feet long and eight feet of ceiling. I believe, according to the latest decisions of science, every cell should have at least 120 feet of floor space, and at least 1,800 cubic feet of breathing space. For such prisoner the cells should not be less than fourteen feet to the ceiling, and at least one-third of the wall space should be open for

ventilation. If these provisions are carried out and the sewerage and the drainage carefully looked after you will have very little trouble with the health of your inmates.

Now the question is, shall the institutions be put under the control of Boards of Health of the different States? Gentlemen, you can not accomplish anything without organization, nothing can be accomplished without a head. The State Board of Health should decide upon a definite plan with regard to these institutions ; they should receive their authority from the State legislatures ; they should appoint an inspector, a physician, if you please a sanitarian whose duty it shall be to visit and inspect every prison and jail in the State. The State Board of Health should not only have the power to inspect, but also to institute reforms. In this way you will be able to secure sufficient floor space and sufficient light and ventilation.

Then there is another very important matter, and that is drainage. To-day, in many jails and penitentiaries they use a bucket for the night soil. A prisoner goes to his cell early in the evening. He must, of necessity, use the bucket, and it must remain in his cell right under his nose until the next morning, when it is removed, emptied and perhaps disinfected (and let me tell you right here that it is very difficult to disinfect anything of this kind), and then it is returned to the cell where it remains until the next morning. In selecting sites for our jails and hospitals and penitentiaries the health officer of the State should be consulted. He should visit the locality and study the site from all its standpoints, and if it does not come up to the sanitary requirements let him condemn it. When the site is finally located, and the building is in process of erection, the health officer should look after the drainage ; so much depends upon the plumbing of the building.

Now, gentlemen, I do not know of any other way for these reforms to be accomplished except to have the Legislature put these matters into the State Board of Health and give them the power to act. When the Legislature has given the Board this power, let them select a man for an inspector who is competent and energetic, and who will nose into every nook and corner of every penitentiary in the State, and when these visits are paid, let them be entirely unawares. In my opinion the sanitary conditions of our jails and penitentiaries is a very important matter, and I do not know of any better plan for thorough reform in

these matters than for our State Legislature to put the whole matter into the hands of the State Board of Health.

PROF. W. H. BREWER, Connecticut: How far in this matter should the Boards of Charities and Correction be set aside? In many States they are supposed to look after these things. The State Boards of Charities and Correction are well organized bodies of men and women, and when they meet in annual conference, this meeting is very small compared to it. At the present time they are supposed to be looking after all these questions. There is no doubt but that the evils alluded to should be corrected, but the different duties of the State Boards of Health and the Boards of Charities and Correction would have to be very clearly defined, or the one would usurp the duties of the other. I would like to ask the gentleman who opened the discussion, how far is it proposed that the Boards of Health take the place and assume the functions of the Boards of Charity and Correction?

DR. BAKER, Michigan: I wish to say a few words in this connection regarding the subject brought up by Prof. Brewer, of Connecticut, but before doing so I wish to indorse, in the main, what has been said by Dr. McMurray; that is, that these subjects should be fully and completely provided for in some manner.

As Prof. Brewer has suggested, in Michigan the State Board of Charities and Corrections has charge of these matters, and I have here a blank form which is used by that Board in the prosecution of this work. I will not take time to read it.

(EXHIBIT A.)

REPORT OF VISIT TO COUNTY JAIL.

To county jail.
Located at
Visited by Date of visit

Building.

Material ; Number of stories
Age years; State of repair
Number of cells , size , confined in each
Provision is made for separate confinement of female and
juvenile prisoners, viz:
and such separation is enforced.
Jail is strong and secure.
Heated by ; Likelihood of fire is
Ventilated by
Is light
Windows are guarded against introduction of tools or liquor.

Arrangement, Condition, Etc.

Bath tubs are..... provided; Lavatories are..... provided;
 Water supply is.....
 Bathing is..... required.....
 Water closets are..... provided; are in..... condition.
 Night buckets are..... used; Material of buckets is.....
 Bedsteads are of.....
 Beds are..... and in..... condition.
 Bedding is of..... and in..... condition.
 It is washed every.....
 Jail is..... clean; Floors are washed every.....
 Cells are..... clean; Floors are washed every.....
 Constant oversight is..... had.....
 Cells are..... examined.....
 Food is..... good; Quantity is..... sufficient.
 Reading is..... provided, consisting of.....
 Sunday services are..... held.....
 Employment is..... furnished prisoners; they were occupied..... when visit was made.

Inmates.

Number of adult males.....; Adult females.....; Boys.....;
 Girls.....; Total.....
 Number awaiting trial....., who have been held.....
 Serving sentence.....; Witnesses.....; Debtors, Insane.....
 Sheriff is Mr.; Paid.....
 Appears to be.....
 Past defects remedied are.....
 Remarks, including recommendations.....
 The County Agent, opinion of his fitness, etc.....

REPORT OF VISIT TO COUNTY POORHOUSE.

To..... County Poorhouse
 Located at.....
 Visited by..... Date of visit.....

Buildings.

Number of.....; Use of each.....
 Material.....; Number of stories (pauper's part).....
 Age.....years; State of repair.....
 Capacity for paupers.....

House.

Use of basement or cellar.....
 Heated by.....; Likelihood of fire is.....
 Fire escapes are..... provided.
 Ventilation is by.....
 Separation of sexes is..... provided for in house.....; In yard.....
 Bathroom is..... provided.
 Lavatories are..... provided.

House is in condition.
Rooms are in condition; Occupied by each.
Beadsteads are of (wood or iron).
Beds are of and in condition.
Bedding is of and in condition.
Clothing is
Food is

Inmates.

Men ; Women ; Boys Ages ;
Girls ; Ages ; Total
Very aged (over years) ; Sick
Insane ; Idiotic ; Other special cases are
..... are employed on farm; are employed in the house;
..... otherwise employed, viz.:
Bathing is required regularly week.
Reading is supplied, consisting of
Religious services are held.
Physician is Dr. ; He is paid
Keeper is Mr. ; Is paid
and is allowed the following help
Drainage is
Water supply is
Privies are situated and in condition.
Past defects remedied are
Remarks (including recommendations)

Instead of these subjects being under the control of the State Board of Health, they are now under the control of the State Board of Charities and Corrections. The inspections in Michigan are made at least yearly, in over eighty counties, and there is a jail in every county. Every jail is supposed to be visited every year, and is supposed to be kept or soon put in a sanitary condition. I also have here a text of a bill which recently passed the Legislature, and is now a law (Act No. 226, Laws of Michigan, 1897), which gives the State Board of Charities and Corrections an oversight over the *construction* of county jails.

(EXHIBIT B.)

ACT NO. 226. LAWS OF MICHIGAN, 1897.

AN ACT to amend section 16 of chapter 9 of the compiled laws of 1871, as amended by section 16, act No. 61 of the public acts of 1877, being section 452 of Howell's Annotated Statutes, approved April 20, 1887, relative to county buildings and furnishing same.

SECTION 1. *The People of the State of Michigan Enact*, That section 16 of chapter 9 of the compiled laws of 1871, as amended by section 16, act No. 61 of the public acts of 1877, being section 452 of Howell's Annotated Statutes, approved April 20, 1877, relative to county buildings and furnishing same, be and is hereby amended so as to read as follows:

Sec. 16. Each organized county shall, at its own cost and expense, pro-

vide at the county seat thereof a suitable court-house, and a suitable and sufficient jail and fireproof offices, and all other necessary public buildings, and keep the same in good repair. That before the plan of any jail, which has been duly authorized to be built, shall be determined or accepted, or contracted for, such plans shall be submitted to the State Board of Corrections and Charities for its examination and opinion, and such State Board shall carefully examine and give the benefit of its study and experience in such matter to the counties submitting such plans and report its opinion to the county clerk of the county so submitting plans, and no contract for the erection of any county jail shall be valid or binding, nor shall any money be paid out of the county treasury for the construction of a jail until such opinion has been duly filed with the county clerk of the county submitting such plans.

Approved May 29, 1897.

It will be seen from the text of this bill that before any plan of any jail which has been duly authorized to be built shall be determined on or accepted, the contract for such building, with the plans, shall be submitted to the State Board of Charities and Corrections for its examination, and such Board shall carefully examine the same and give the benefit of its study and experience in such matters to the county submitting such plans, and report its opinion to the county clerk of the county so submitting plans, and no contract for the erection of any county jail shall be valid or be binding, nor shall any money be paid out of the county treasury for the construction of the jail, until such opinion has been duly filed with the clerk of the county submitting such plans.

This is the way we deal with this question in Michigan.

DR. JAMES EVANS, S. C.: Are there any sanitarians on that Board?

DR. BAKER, Michigan: I do not know the exact personnel of the Board. It is appointed by the Governor, by and with the advice of the Senate. One of the members of that Board is a physician, a resident of the city of Detroit, and was at one time a member of the Detroit Board of Health. He has also been President of the State Medical Society. The duties of the Board, as specified by the bill, are such as might be performed by men not very deeply versed in sanitary science.

DR. J. C. SCHRADER, Iowa City, Iowa: In connection with this matter I might mention the way these questions are handled in Iowa. We have an average of three sessions of court every year, in each county, and the grand jury is in session perhaps a week during each session of court. It is the duty of the judge to instruct the grand jury to inspect the jails, accompanied by a physician, gen-

erally the county physician, and bring in a report to him regarding the jails, poorhouses and other buildings that may be erected for the care of the poor or of the incurably insane. Reports of the condition of these buildings are made in writing to the judge at least three times a year, so that we know in that way the condition of our buildings which are provided for the care of our criminal population, for the incurably insane, and for our paupers.

DR. McMURRAY, Nashville, Tenn.: I do not think the plan pursued in Iowa is calculated to produce the best results. The county officials always know when the grand jury is to meet, and they have an abundance of time to prepare for the inspection. In connection with this matter, I am formally of the opinion that separate wards should be provided for inmates suffering from contagious diseases. For instance, Small-pox breaks out in jail, there should be provided some place in which to isolate patients suffering from it. I also think that Tuberculosis should be classed among the contagious diseases, and the patients isolated from other patients of an institution, and the sputum should be carefully disposed of. If the sanitary conditions of our jails and public institutions are carefully looked after, and if all cases of contagious diseases are carefully isolated from other inmates, the death rate will certainly be reduced to a minimum.

DR. R. H. LEWIS, Raleigh, N. C.: In North Carolina the jail question has solved itself. We are working the convicts on the public roads, and in that way they are assured plenty of fresh air, they get plenty to eat, and the mortality is remarkably low. In some cases they are allowed to spend Saturday night and Sunday with their families, and report to the county authorities on Monday morning at sunrise. This is literally true. I was assured by a leading citizen of one county that there had been but one attempt to escape since this plan had been in operation.

DR. W. J. McMURRAY, Tennessee: I am in favor of leaving this matter of sanitation in the jails and penitentiaries in the hands of the State Board of Health.

PROPOSED BY THE PROVINCIAL BOARD OF HEALTH OF QUEBEC:

"SHOULD BOARDS OF HEALTH PERMIT THE FEEDING OF HOGS WITH (a) OFFAL FROM SLAUGHTER HOUSES, (b) MEAT COOKED, OR NOT, FROM KNACKERS' YARDS?"

DR. U. O. B. WINGATE, Wisconsin: Mr. Chairman and Gentlemen—When I was informed that I would be expected to open this discussion, it occurred to me first that it would be a good plan to find whether or not the feeding of hogs with meat was a common procedure. I therefore wrote to several of our leading packers, and I will read the letters which I received in answer:

LAYTON & Co., MILWAUKEE, July 8, 1897.

U. O. B. Wingate, M. D., Sec'y State Board of Health, Milwaukee, Wis.:

DEAR SIR—Replying to your favor of the 6th inst., we have not heard of anyone feeding meat to hogs and do not think we are getting any fed that way. We do not know much about it, but should not think it would be a good food for hogs, as it would be apt to make them soft and oily.

Yours truly,

LAYTON & Co.,
C. F. DICKENS.

BODDEN PACKING Co., MILWAUKEE, July 7, 1897.

U. O. B. Wingate, Esq., Sec'y State Board of Health, Milwaukee, Wis.:

DEAR SIR—Replying to your favor of the 6th, we have no means of knowing what the hogs we purchase are fed with, but as they are mostly shipped from the farms, should judge they are fattened on corn or grain. Never heard of hogs being fed on meats, and, never making any investigation in regard to the matter, can not say whether it is good feed or not.

Yours truly,

BODDEN PACKING Co.,
GEO. A. ADLAM, Sec'y.

PLANKINTON PACKING Co., MILWAUKEE, July 7, 1897.

U. O. B. Wingate, M. D., Sec'y State Board of Health, City:

DEAR SIR—In reply to your letter of July 6, we write to say that we do not feed meat of any kind to any of the hogs that we handle here, and we are of the opinion that there are no meats fed to hogs anywhere in this neighborhood, excepting, possibly, a remote case. As regards it being proper or good food for hogs, we are really not in a position to express an opinion. In past years, a great many hogs have been fed around country slaughter-houses, and the results, as far our knowledge goes, are that the meat from hogs fed in this way is just as healthy as any corn-fed or grain-fed hogs.

Within the past ten or fifteen years there has been a vast change. The country slaughter-houses are growing less and less every year, owing to the facilities which now prevail in the transportation of fresh meats from the large centers. This being the case, there are, of course, less hogs fed on the offal around country slaughter-houses. Yours truly,

PLANKINTON PACKING Co.,
F. R. BURROWS.

CUDAHY BROTHERS Co., MILWAUKEE, July 8, 1897.
U. O. B. Wingate, M. D., Sec'y State Board of Health, Milwaukee, Wis.:

DEAR SIR—Your letter to hand, and, in reply, would say that we do not know of any place where meat is fed to hogs either cooked or uncooked, nor can we give you any information regarding the effect of such feed upon hogs. Our own private opinion is that it would not be good. We have never had any experience, do not know and are probably prejudiced in the matter.

Yours truly,

CUDAHY BROTHERS Co.,

PATRICK CUDAHY, President.

INTERNATIONAL PACKING Co., CHICAGO, July 8, 1897.
U. O. B. Wingate, M. D., Sec'y State Board of Health, Milwaukee, Wis.:

DEAR SIR—Replying to your favor of the 7th inst. as to what extent the hogs we kill are fed upon meats of any kind, would say that we were not aware that hogs were fed upon meats at all, except what the farmer might throw them from his own table, and we have no means whatever of finding out to what extent this is done, from the fact that we buy about 5,000 hogs a day in the open market, and these hogs come from all parts of the West and Northwest country, and it would be impossible for us to find out the raisers of these hogs.

As for meat being a proper food for hogs, would state that it probably is, provided that the farmers can afford to feed it to them.

As far as our knowledge goes, we understand that the farmers raise their hogs principally upon corn, sometimes wheat and other cereals, this being the best sort of food for fattening purposes.

We should suppose that you were aware of all these points without asking our advice or opinion in the matter, but we have answered your letter as nearly as possible, as requested.

Yours very truly,

INTERNATIONAL PACKING Co.,

HIRAM BEARS, Secretary.

SWIFT AND COMPANY, CHICAGO, July 9, 1897.

Mr. U. O. B. Wingate, 204 Biddle St., Milwaukee, Wis.:

DEAR SIR—Replying to your favor of the 7th inst., will state: As we have nothing to do with the raising of hogs, we can not positively say whether or not any of the hogs we kill are fed upon meats of any kind.

We, however, firmly believe that hogs are not fed upon any kind of meat.

Yours respectfully, SWIFT AND COMPANY,

L. F. S.

LIBBY, MCNEILL & LIBBY, CHICAGO, July 9, 1897.

U. O. B. Wingate, M. D., Sec'y State Board of Health, Milwaukee, Wis.:

DEAR SIR—We are in receipt of yours of the 5th, wanting to know to what extent the hogs we kill are fed upon meat of any kind. Will say that we do not kill hogs at all, but are strictly a beef-house.

Yours truly,

LIBBY, MCNEILL & LIBBY (Inc.),

W. F. BURROWS.

NELSON MORRIS & Co., CHICAGO, July 10, 1897.

Hon. U. O. B. Wingate, Sec'y State Board of Health, Milwaukee, Wis.:

DEAR SIR—Replying to your esteemed favor of the 7th inst., we beg to say that all the hogs bought by us for slaughter are bought by us in open market at the stock yards, and are, to the best of our knowledge, strictly corn-fed. Our buyers aim to buy no other kind of hogs, owing to the general opinion that hogs fed in this way make the best and most solid kind of meat and fat.

In view of the above, our opinion on the subject you inquire about would scarcely be of any value. We do not understand that hogs fed on meats come to this market in any appreciable quantity.

Yours respectfully, NELSON MORRIS & Co.,
WOLFNER.

ARMOUR FERTILIZER WORKS, CHICAGO, July 8, 1897.

U. O. B. Wingate, M. D., Sec'y State Board of Health, Milwaukee, Wis.:

DEAR SIR—Your favor of the 7th of July has careful consideration.

Very few, if any, of the hogs received in this market are fed on meats of any kind, as far as we know. We occasionally sell raisers of fine blooded stock some dried blood or meat tankage. This latter is the tissue and bone dropped to the bottom of steel tanks in which the meat has been cooked under pressure for six hours to remove the grease. This meat is dried at once in steam driers and ground to a fine powder.

There is no question in our mind but what hogs are much healthier and make better food if they are fed partly on meat in some form. Nearly all hogs grown in the west are corn-fed. This ration forms great quantities of fat, but is decidedly deficient in the muscle and bone forming protein, and corn-fed hogs fall easy victims to cholera and such diseases, whereas the swill-fed and meat-fed hogs, possessing much more vitality, do not seem to be so easily affected. In addition to this, and from a commercial standpoint, hogs containing more lean make better hams and bacon and sell better in the various hog markets of the country.

Prof. W. A. Henry, of the University at Madison, Wis., has made experiments along these lines, and a good deal of work of this character has been done in Germany, proving that meat meals and dried blood are very desirable additions to farm products as food for hogs and cattle.

All the blood and tankage coming from properly equipped packing houses are treated in such a way, and at such high temperatures that any bacteria which might possibly exist in the hog when alive would be killed.

There are always some hogs fed on the offal around the various small slaughter-houses throughout the United States, but these are all killed by local slaughterers.

If we can give you any further information, we will be glad to do so.

Yours very truly,
ARMOUR FERTILIZER WORKS,
C. H. McDowell.

I wrote to Prof. Henry, of Madison, who has been studying this question for some time, and he sends me the following:

UNIVERSITY OF WISCONSIN, MADISON, July 14, 1897.

U. O. B. Wingate, M. D., Sec'y State Board of Health, Milwaukee, Wis.:

DEAR SIR—Under separate cover, I mail you a copy of our Tenth Annual Report, which gives a summary of the hog feeding experiments of this station to that date. I regret not being able to send you our Fifth, Sixth and Seventh Reports giving experiments in detail with the feeding dried blood, but these volumes are now out of print. I also send you our Twelfth and Thirteenth Reports, which contain some additional experiments with pigs. Dried blood was fed to pigs in experiments by Prof. J. W. Sanborn of Missouri, several years ago, but his reports are also out of print. Meat scrap, a by-product in the manufacture of various meat extracts, is fed to various farm animals in Europe; horses, sheep, and cattle being included. The Arabs fed their horses on meat at times as well as on dates and barley. I have recently received from Denmark samples of a dry mixture which is made from beet sugar molasses and fresh blood. We know that our pou-

try and many game birds live upon insects and the smaller animal life, and we have no objection to eating these creatures.

In view of all the facts, I do not know why a Board of Health should object to swine being fed meat under reasonable limitations. In many places this is the proper way, in my judgment, of disposing of worn-out horses, as also of slaughter-house waste. Of course, the operation should be conducted in a cleanly manner and the animals not too heavily fed with this single food. Further, they should probably be fed grain for some time before slaughter. My only basis for this last statement is the fact that the flesh of swine fed corn has been found to be more tender than that from the same animal when fed much protein in the shape of bran, shorts, etc.

Very respectfully,

W. A. HENRY, Dean and Director.

FIRST AND SECOND REPORTS OF THE MASSACHUSETTS STATE BOARD OF HEALTH, 1870-1871.

The pig is almost the only quadruped feeding in whole, or in part, on flesh which civilized man is willing to eat, unless pressed by starvation. Among ourselves, the only exceptions are the bear and the raccoon, and meat is not the chief food of either of these animals. The slaughter-house hog not only eats flesh, but flesh in a state of putridity, and is therefore entitled to be regarded as the carrion beast. If he is good to eat, so are the crow and the buzzard.

Few persons would be willing to eat him if they saw him in his putrid sty, with wreaths of entrails hanging about his neck, and his body smeared with blood. We are not prepared to assert that eating pork fed in this way is productive of any special disease, parasitic or otherwise. It would be very difficult, and perhaps impossible, to prove. Butchers often say that pigs fed on beef offal make good pork, and better than pigs fed on sheep offal. However this may be, we can say with certainty that *human instinct* (which is sometimes better than reason) recoils from such food.

We know that the fat of the carrion beast is soft, and prone to decomposition, unless his diet is changed to grain before killing. If the question is asked of any butcher in the market whether the pork he offers for sale is from a slaughter-house pen, the reply will be such as to satisfy the inquirer that such origin is not considered a recommendation.

The second objection to slaughter-house piggeries is of a more positive character. If anything is settled as to the cause of disease, it is the influence of decomposing organic matter in giving rise to diarrhoeal affections and Typhoid Fever, in depressing the vitality of children, thus rendering them less capable of resisting disease in every form, and in making all the epidemics more active and virulent.

The slaughter-house pig-pens are filled with putrid animal matter, with rotting blood mingled with excrement, and are therefore a source of danger to public health. * * *

The reform of any social evil may be greatly hastened if it can be shown that it does not involve pecuniary loss. Whoever attempts to reform our modes of slaughtering animals must be prepared to meet the universal statement among the butchers that hogs fed upon blood and offal are a source of profit. *We can not deny it*, while at the same time asserting that, as a source of danger to public health, the practice ought to be given up.

The keeping of hogs at slaughter-houses, and their subsistence upon the offal thereof, must receive absolute condemnation.

PRACTICAL CONCLUSIONS DRAWN FROM EXPERIMENTS IN
PIG FEEDING, 1883-89.

BY PROF. W. A. HENRY, MADISON.

All things considered, the hog has been the most profitable animal on western farms, and no small part of the wealth of the Western States is due to this one animal. Corn is and has been the almost universal food for swine in this section, and so it is to Indian corn that we are indebted for the benefits accruing from the hog. No other plant furnishes so much available food to the acre, or food that is so well relished by the hog, as corn. With millions of acres of land devoted to corn growing, and a large part of this corn being fed to hogs, it is no wonder we have come to regard corn as made for the hog and the hog for corn. To one who first acquaints himself with the situation it might appear that all the farmer has to do to increase his income is to plant more corn and raise more hogs, but the investigator will soon find that were the markets open to all that could be raised, there seems a limit to the pork production of any farm or locality, for numerous difficulties beset this vocation. Pigs are born only to meet an early death; Hog Cholera devastates large areas, passing from point to point with great rapidity, clearing everything before it, leaving the farms not only without swine, but so inoculated with the disease that all the business in that section must be held in abeyance for a year or more. Farmers are constantly complaining that their hogs become too fine-boned, and get but temporary relief by sending off to breeders for coarse-boned sires. These facts show that as now handled on the average farm at the West, the hog is in an abnormal condition and that degeneration is constantly going on, or popularly stated, "stock runs out." The difficulties in the way do not end with the troubles named, but follow the hog even after death, into the pork barrel. Foreigners claim that our pork is diseased, and place an embargo upon it. Home consumption is decreasing, not because our people think the pork is diseased in itself necessarily, but because the meat is so excessively fat that there arises a strong aversion against it in the minds of most people. As people in the lower classes in life get ahead in the world they give up pork for more expensive meat. Not only, then, have we to consider the questions of hog feeding from the standpoint of feeder and breeder, but the opinion and wish of the consumer must receive attention, if this industry, of such great magnitude, is to continue on a sound basis.

That with proper care, the form, size, substance and bone of the hog can be well maintained, and even advanced, is shown by the fact that careful, intelligent breeders and specialists hold their stock up to a high standard of excellence, and even improve it. Nor is it difficult for the intelligent farmer to keep his stock where it will yield a satisfactory profit. First of all there must be a careful discrimination between the hogs used for breeders and those intended only for feeders. Breeding from immature stock must be avoided as much as possible, for this is probably one of the greatest sources of the present lack of constitution. To fatten brood sows after they have farrowed off litters once or twice is a practice, most unfortunately, altogether too common. Good mothers should be held for breeders as long as possible. The care of the pig must begin before it is born, by not only giving the dam comfortable quarters, but supplying such food as is essential for the building up of the bodies of her young. During pregnancy the sow should receive plenty of protein food in the shape of blue grass or clover pasture, bran, shorts, middlings, shipstuff, skim-milk, and peas. It is impossible to keep brood sows through the winter on Indian corn alone and have good results at farrowing time. Even if large litters of pigs are successfully brought into the world by dams so fed, there must be a weakening of constitution which sooner or later will bring disastrous results. Since it is the cheapest food on the list, corn very properly may

form part of the ration of hogs at all times, but to cause a brood sow to not only maintain her own life but the bodies of a litter of young from the elements contained in the daily ration of corn is simply out of the question. There are not enough bone and muscle elements in the corn a brood sow can consume to suffice for building up the bodies of her young.

Unless the farmer has the proper buildings and conveniences for attending to the wants of brood sows it is better to have the pigs born in the summer time, when the mothers are running on pasture, for with pigs brought into the world under such conditions the risk is reduced to the minimum. When born it is profitable to push the pigs forward as rapidly as possible by feeding the mother heavily on nutritious diet, which should contain a very considerable amount of protein and ash elements, since the bodies of young pigs expand rapidly and should be built up in bone and muscle and not fat. The cheapest gain made by hogs at this station was when feeding sows with young pigs so heavily that they even gained in weight while suckling their young. Less than three pounds of feed then made a pound of gain. Having grown a strong muscular frame the time comes when the farmer must separate the breeding stock from the remainder of the herd and give it different treatment. Breeding stock should be kept out of doors, on pasture as much as possible, and every attention given towards keeping the animal natural and healthy. The final purpose to which hogs for the market are intended must direct the way in which they are handled. With a well grown carcass of 100 pounds for a basis, hogs which are intended for the general market can be fed almost exclusively on corn, adding a little ground oats, shorts, skim-milk or other protein food. As far as possible, however, in these times of low prices, hogs should be grown on pastures, and corn used only to ripen up the animal. On our western farms land is the cheapest and labor the dearest thing we have. The hog that runs in a clover field or blue grass pasture waits on himself, and makes a healthy growth, if not a very fast one. This growth is usually more profitable than that made from entire grain feed. Usually a part ration of grain can be profitably fed to grazing hogs to hasten their growth.

Where the general market is the destination, one can not be over-particular about the pork product, but must manage it at all points in the very cheapest way.

Farmers who are fattening steers should try feeding shelled corn and putting hogs with them. Our experience shows that the farmer who stanchions or ties up steers and gives corn meal for the main feed produces about the dearest beef that can be made. Let the steers run loose in an open yard or shed, with a good vigorous shote for each steer. The shote may yield some profit to the owner if the steer does not.

There is a growing demand for clean, wholesome pork, which should be catered to by intelligent farmers. Thousands of people are willing to pay increased prices for pork made from healthy, well-fed animals, kept in a cleanly manner. There is no reason why farmers can not co-operate and establish small packing houses which shall send out smoked ham, breakfast bacon, sausage and lard, which will be eagerly bought up at good prices by a discriminating public. The marvelous growth of the creamery business in the west during the last decade hints at what may be done in the pork trade. If the butter trade of the west was controlled by a few operators in Chicago who received the whole product and distributed it back again to the people, there would be no demand for intelligent dairying. A pound of butter oil produced by one party would sell for as much as that produced by another, and the large manipulators would make all the profits. A market for choice pork must be created and enlarged and the public properly informed of the situation before this matter will take proper shape. The plan is feasible, and certain sooner or later to be brought about.

Hogs fed to produce a large percentage of lean meat must, to be profitable, sell for at least 20 per cent. more than current prices. A discriminating market will soon pay this difference. Every animal requires a certain amount of food for its maintenance; the hog is no exception, and in feeding

we should remember that he will attend to his own bodily wants first of all and only lay on flesh afterwards. With his wonderful appetite and immense digestive powers, it is the height of folly to keep the hog on part rations. It is the satisfied, quiet hog that brings money to the owner. On the other hand we have found that our best gains came from hogs so anxious at meal time for their feed that they would show their greedy appetite by squealing. We do not believe in the practice of keeping feed before the hog at all times.

In order to make first-class pork cleanliness is the first requisite. Not only should the pigs be kept in clean quarters, but their food should be clean and wholesome. The dairy farmer is well situated for producing this kind of pork, since skim-milk and buttermilk are rich in both protein and ash. Where the largest gain only is considered we have not found it advisable to feed over two or three pounds of skim-milk to one of corn meal. A larger amount of milk would give a somewhat increased amount of lean meat, but hardly enough to pay for the increased cost which the milk would necessitate. The limit for the amount of milk to meal, just given, should not be exceeded, but additional protein food, furnished in the form of oats, shorts or pea meal. Where peas can be grown they are admirable protein food, and should make a choice quality of pork. Peas can be sown broadcast in early spring, and when ripening can be fed down by hogs at no expense for gathering the crop. Our feeding trials show that oats are an admirable accompaniment to corn, the combination giving the best returns we have made, excepting skim-milk and corn meal. The protein and ash of the oat reinforces the corn meal, and the combination should give pork of fine quality. It is believed that there is a limit to the amount of lean meat which can be produced in a hog's body.

An excessive proportion is certainly not as desirable as it might seem at first thought. Unless there is a due proportion of fat interlarded with the lean, marbled as we commonly say, the meat will be flavorless. The flavor of good meat comes quite largely, no doubt, from the mixture of fat with lean. This should be borne in mind in producing meat of good quality. High grade pork will not permit the hog from which it is made to become too heavy, since most of the increase, after reaching a certain point, is only fat. Two hundred or two hundred and fifty pounds is probably the limit for the best class of carcasses of the kind under consideration, with the large breeds common at the west.

In this review of our work we started out with a statement of the prevalence of corn for hog feeding at the west. All through our work we have been surprised at the power of this grain for producing gain. We have also been surprised to see how perfectly satisfied the hog was when existing upon a corn diet. It is plain to any one who studies the subject, even casually, that as the prosperity of the west in the past has been based upon corn, so corn must continue to be the great money-making crop of that section. If pork raising is to continue one of the leading industries, a large part of the product must continue to be the result of feeding corn. There is no doubt but that corn makes pork of fine quality and great firmness, if properly fed. It should be distinctly borne in mind, then, that we have not a word to say against the use of corn for pork production. It is against the abuse of corn, and not its use, that we have written. Intelligently fed, corn is all right; only in its abuse is there any wrong. There need be no less corn fed, but more protein food should be given in the shape of clover, blue grass, oats and other grains, along with the corn now given them.

We can not close this article without alluding briefly to the importance of feeding ashes to hogs. Many farmers are obliged to feed corn in large quantities upon prairie farms, where hardwood ashes are scarce or unknown, and yet upon these very farms there is the greatest need of ash material for aiding in building up the bone of hogs. Corncobs furnish a very strong ash and should be burned and the ashes carefully saved and fed to the hogs.

My own conclusion, in view of these letters from packers, is, that we are not warranted in condemning the practice of feeding meat to hogs under proper restrictions. I do not see any reason why meat, under proper conditions, should not be a desirable food for hogs.

DR. G. FARRAR PATTON, Louisiana: Judging from the letters from business men who are supposed to know most about hogs, I can see no reason why meat should not be fed to hogs, under proper restrictions. If a Board of Health has the power to inspect slaughter-houses, and to enforce sanitary regulations, there can be no objection to feeding meat to hogs, especially if it be properly cooked at sufficiently high temperature, and for a sufficient length of time, to destroy any germs which it might possibly contain. If Boards of Health have power to inspect slaughter-houses, and to enforce cleanliness, meat under proper restriction would seem to be proper food.

PROF. W. H. BREWER, Connecticut: As a teacher in an agricultural college this question is of interest to me. I can see no reason in the world why some portion of meat in some form should not be fed to hogs. The two chief diseases which we get from pork are Trichinosis and Tapeworm. So far as my knowledge goes, veal is a more common source of Tapeworm than pork. So far as the parasite of Trichinosis is concerned, I do not know for a certainty where hogs derive that organism. It is supposed by many that they derive it from eating rats and mice. Of course these are eaten raw. Under proper restrictions I can see no reason why meat is not only a proper but beneficial food for hogs.

DR. FULTON, Baltimore, Md.: If I seem to differ widely from the gentlemen who have spoken upon this subject, it is because my information comes from different sources. The same inquiry pursued among the small butchers would have led our western friends, I suspect, to the same conclusions which we hold in the east.

I do not think the great pork packers of Chicago and Milwaukee have any evidence of much value in discussing this question. These large concerns have more rational and more economical uses for all their offal. The practice of feeding offal to hogs is confined almost entirely to the smaller slaughter-houses scattered throughout the country. The dangers arising from this practice are not visionary, but only too real. The first and most important danger is

the spread of Trichinosis. Most of our trichinous pork comes from offal-fed hogs, and while little or no trichinous pork is exported from the United States, it is the laxity of our views about feeding hogs which has caused the foreigner to regard our pork with suspicion. How direct the infection of offal-fed hogs may be has not been determined, but the effect of offal-feeding upon rats and mice has been carefully studied by Dr. Stiles, of Washington. A paper upon the subject is in the Year Book of the Agricultural Department just published, and perhaps lying on most of your desks at this moment. An examination of slaughter-house rats shows that about 55 per cent. have Trichinosis. Of meat shop rats about 57 per cent. are trichinous, while corn-crib, barn, hotel and feed store rats show only $2\frac{1}{2}$ per cent. of Trichinosis. Now you can easily see that chances for offal-fed hogs to acquire Trichinosis is just the same as that of the offal-fed rat. Besides, it must be remembered that hogs will eat rats.

Hardly less important is the danger of feeding the offal of tuberculous animals. The dangers of tuberculous infection are so many and so familiar to us all that they have lost much of their terrors. I need not more than allude to this point.

If hogs should not be fed with butcher's offal, no more should dogs. From the lungs, liver and other organs of cattle and sheep, dogs become infected with the *Echinococcus*. The resulting tape-worm infects the dog's bowels with eggs which the dog scatters in his dejections. This infection, when received by man, is very fatal, and is said to be on the increase in this country.

Another objection to the feed of slaughter-house offal to hogs, aside from the danger of propagating disease, is that it produces a very inferior pork, easily recognized, so I am told, by people in that line of business, and by those who are familiar with the inspection of meats. The pork packers of Milwaukee and Chicago know very little about offal-fed hogs, but in the east, where more offal-fed pork is offered in the market, it is considered very undesirable.

So far as the feeding of knackers' meat to hogs is concerned, I can see no choice between doing this and feeding animals with the bacillus of Anthrax, or of Glanders, or of Actinomycosis. I think the feeding of hogs with raw meat from knackers' yards is almost unpardonable. If it were thoroughly cooked, I grant you that specific infection would be destroyed, but I hold that even cooked carrion is not fit

diet for the animals which are destined to be food for man. There could be no practical guarantee of the cooking process, and some of these bacteria, notably the antrax bacillus, resist greater heat than a careless stock feeder would be likely to apply. There is no good reason why this question should be debated at all, for all this material is convertible into one sort or another of commercial product, and should be so converted or else destroyed.

DR. BENJAMIN LEE, Philadelphia, Pa.: I rise to establish my own identity. I am at a loss to know, after this discussion, whether I am a farmer, a pork-packer, or a sanitarian. I agree with what the last gentleman said, that the pork-packers of Chicago and Milwaukee are hardly the right men to go to for information upon this subject. They do not know what food is the best for hogs, as they have nothing to do with the raising of the animals, but simply purchase them in the open market. There are very few slaughter-houses in my own State in connection with which there is not a piggery, and these constitute the most offensive form of nuisance with which we have to deal. The last Legislature gave the State Board of Health control over bone boiling establishments so often as associated with slaughter-houses, and the Board has adopted regulations which forbid the establishment of piggeries in connection with slaughter-houses, not so much for the protection of the pork as for the prevention of a nuisance. We also require that when offal is fed to hogs, it should be thoroughly cooked, and we believe that cooked offal is not only perfectly safe but a desirable food for hogs.

DR. U. O. B. WINGATE, Wisconsin: I certainly believe that properly cooked meat is not only a proper, but beneficial food for hogs and produces good wholesome pork.

DR. BAKER, Michigan: Do I understand correctly that in Pennsylvania there is a legal provision for feeding offal to hogs, and by offal are the intestines understood?

DR. LEE, Pennsylvania: There is no law on the subject. The regulations of the State Board of Health do not forbid the feeding of cooked offal, including the intestines, to hogs.

Upon motion, properly seconded, the name of the Association was changed to "The Conference of State and Provincial Boards of Health of North America."

The following amendment was briefly discussed, and, upon motion, was indefinitely postponed.

The members of this Conference shall be the executive officers, and other delegates representatives of the National State and Provincial Boards of Health, and the quarantine physicians, National, State and Municipal, of the United States of America, the Dominion of Canada and the Republic of Mexico.

After considerable discussion as to the advisability of having the Conference, as a body, decide upon the next place of meeting, Dr. Henry B. Baker, of Michigan, made the following motion :

Moved, that the provision of the constitution which requires the Conference to refrain from determining the place of its own meeting be stricken out.

The motion was seconded but not carried, but a further motion advising the Executive Committee that it was the desire of the Conference to hold its next meeting at Detroit, Michigan, about the 30th of July, was offered, seconded and passed.

Dwight

PROCEEDINGS
OF THE
THIRTEENTH ANNUAL MEETING
OF THE
CONFERENCE OF STATE
AND
PROVINCIAL BOARDS OF HEALTH
OF NORTH AMERICA

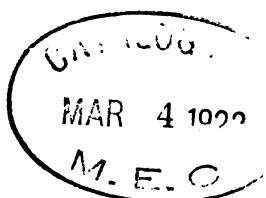
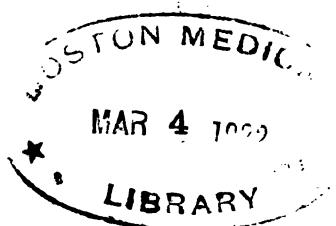
DETROIT, MICHIGAN, AUGUST 10TH, 1898

INDIANAPOLIS:
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PRELIMINARY SESSION.

The preliminary session of the Conference of State and Provincial Boards of Health of North America opened in the ordinary of Hotel Cadillac, Detroit, Mich., at 9 a. m., Wednesday, August 10, 1898. The Conference was called to order by Hon. Frank Wells, Chairman of the Michigan State Board of Health, after which prayer was offered by Rev. John McCarroll, of Grace Episcopal Church, Detroit. The address of welcome was delivered by Dr. Heneage Gibbes, Health Officer of Detroit, as follows:

Mr. President and Gentlemen--It has devolved upon me to welcome you here, and I assure you that there is nothing that could give me greater pleasure. I most heartily welcome you to this city of ours, which is one of the most, if not the most, beautiful cities in this country. We have everything here that will conduce to man's welfare here below, I think, and, with the exception of a few diseases, with which we have had a little trouble, everything is as satisfactory as one could wish for. I presume, with the reading of the matter prepared by the sanitarians present, that we shall learn something that will enable us to stamp out the little disease which we now have.

It seems to me that in combating diseases in either large cities or small ones, the great difficulty is with the education of the people themselves to the supreme necessity of attending to sanitary rules and regulations. And in this regard, also, I do not think that the sanitary laws are sufficiently stringent, nor are the powers of the health officer great enough. In this State, at least, they are not. If we find a case of a contagious disease, we can quarantine the house, but we have not the power to isolate the patient, without consent to the removal of him from the midst of the people. I think in many cases outbreaks of disease could be effectually controlled if the health officer had this power.

In the matter of educating the people in regard to sanitation, I think it is a mistake to advance theoretical views as to the cause of disease. Where the people are educated one year by the newspapers to consider one thing the cause of a disease, which, upon further investigation, is proved not to be the cause, they refuse to believe anything. There has been much published in these matters that is nothing but pure nonsense. The people must be educated practically. Take a case of scarlet fever, for instance. You quarantine it. At the same time, if the neighbors are taught that their children will contract the disease if they are not kept away, then you have educated a larger or smaller area, as the case may be. With all due deference to those of greater experience, it seems to me that this is the practical way of educating the people, who certainly will pay greater attention to facts than to theories. Then there is the germ theory. Everybody is scared; but the knowledge of the doctor himself in these matters is limited, and it opens a great field for quacks, some of whom claim to drive the germs to the surface by means of baths and then kill them by some stuff which they put in the water. I say many of these theories are harmful, and I think the less said on subjects upon

which we are not absolutely positive, the better it will be for everyone. Again I say, what we want is practical common sense in dealing with people not too highly educated in many other things than sanitation. Of course, it is all very well for scientists to formulate theories and continue their investigations, but I think it is a mistake to publish unsubstantiated theories and say that is the cause of this disease or that disease, and the next year say something else is. I don't think the education of the people along these theoretical lines does very much good, and that education along these lines should be dropped.

Now again as to the laws. They must be made more stringent. If a case of smallpox develops, the patient cannot be removed to the pest house if the people object; that is where the law is deficient, at least the law of this State is deficient.

In conclusion, I would like to ask you to take hold of the matters where we really need help in our everyday work, and recommend such legislation as will meet emergencies, and to give sufficient power to the officers to enforce the laws.

In response to the address of welcome, the President, Dr. Benjamin Lee, Pennsylvania, spoke as follows:

Dr. Gibbes, Mr. Chairman and Gentlemen—It always gives much pleasure and satisfaction to come to the city of Detroit; not only because it is a beautiful city—possibly the most beautiful city in the United States, as we have been told—not only because it is a city of noble, generous-hearted, hospitable men and gracious and beautiful women; not only because it is a city which has made great advances in sanitary government under the efficient administration of the present health officer, but because, when I come here, I always find something new—something a little in advance of what I have found anywhere else. In this visit I have found something new, and something to which I think Dr. Gibbes should make some reference in his next report. I do not think there is a city in the United States that can boast of so many one-legged men. I am not speaking at random in regard to this. I notice that in your tailor shops you have pantaloons for one-legged men, and you say, in addition, that "no charge will be made for the other leg." I have never seen this offer anywhere else. I can only attribute it to the fact that you have in this city a wonderful proportion of one-legged men, and I call attention to the fact because I have not seen it mentioned in the printed reports, and trust the omission will be remedied in the next. [Laughter.]

You have here a beautiful river and lake, but I do not intend to give you any more taffy on their beauty, as you have had a good deal of that already; but I will say that I do not see any reason why you should pride yourselves upon the fact. You cannot help their being there. In the very first record we have of this country, in the charming sketch by Father Hennepin, he alludes to this strait as being more beautiful than Niagara, asserting that its islands are without compare, that its shores are ravishing, and that in the distance one could see vine-clad hills and groves, so arranged that it did not seem possible to conceive that nature alone had done the work, but that man must have had something to do with the beautiful diversification of meadows and groves. I say, therefore, that you cannot pride yourselves on this. It is something which nature has very kindly done for you.

Now, furthermore as to this strait. Detroit, as you well know, means a strait. Detroit means destruction. The change is made by the simple alteration of one letter. Now this strait, beautiful as it was originally—a life-giving stream—may, by a very slight alteration, be transformed into detruit—destruction. The aboriginal inhabitants worshiped the lake as a divinity. They made offerings to it, and anyone who was guilty of its

pollution was deemed guilty of profanation, and punished. At present, I regret to say, there is no such respect for the divinity of the lake, and pollution is poured into it wholesale.

In the admirable paper of Mr. Williams you were told of the dangers that lurked in the lake and in the strait. I came here impressed with the fact, which I have always tried to impress upon the people of Philadelphia, that that city has the worst water supply of any city in the country, and that their typhoid rate is higher than that of most cities in the country. I find, to my surprise, in looking over the admirable sketch which has been prepared for us, that the typhoid death-rate of Detroit, taken for several years back, is higher than the rate of Philadelphia. You have a low general death-rate, but do not trust yourselves to this. You have no business to have a high typhoid death-rate. The paper of Mr. Williams called attention to the pollution at Port Huron. I regret to see that many men in that convention pooh-poohed the whole thing, claiming that, even if the lake was polluted at Port Huron, it was not possible for a germ to reach this city; that water, in flowing a small number of miles, purifies itself; that the tables and curves and tracings presented for your information and instruction by your efficient State Secretary were worth little more than the paper on which they were transcribed. What are we going to do with men of that kind? We cannot hang them. In fact, I, for one, would not agree to hang them, for, as a rule, they are jolly good fellows—men with whom we like to meet—and possibly the very obstacles which they throw in our way are simply an additional impulse to us to go forward in the work to which we have set ourselves of educating public opinion as to the importance of having our water supplies as pure as we can possibly make them and keep them. But I want to say that the beautiful water of the St. Clair, in my opinion, is more dangerous than the coffee-colored or inky fluid which the city authorities of Philadelphia give to us to drink. My reason for thinking so is this: it pretends to be pure. Now, our water in Philadelphia is strictly honest. It is not pure, and does not pretend to be pure. It is vile, and it looks vile; and one picking up a glass of it will think twice before drinking it. For this reason, then, I think we are better off than you are. I beg you to ponder, therefore, upon this question: Is not this beautiful Detroit in danger of becoming Detroit?

You have spoken, sir, of the importance of enforcement of law, and of the difficulty of the education of the general public. If I did not misapprehend you, you spoke somewhat disparagingly of endeavoring to educate the general public by literary means—tracts, lectures and that sort of thing. Now, personally, my experience leads me to think that, while we should not neglect one of these processes, we should strongly insist upon both. We should certainly educate the public by written documents, lectures and conventions, and also by the enforcement of law. In one respect, I think, you indicated a weak spot in the laws of Detroit. Philadelphia has the advantage of you there. If I know that there is a case of smallpox in Philadelphia, and think it a menace to the health of the city, and that it could not be safely cared for in the house in which it exists, I can issue an order to convey the patient to the municipal hospital. That is a strong feature of the laws in Pennsylvania, and one which Detroit and Michigan will do well to copy. The health officer of every city should have that power. If he thinks a case is a menace to the health of the city, he should be able to isolate the patient, not only in the house in which it exists, but to convey the patient to the municipal hospital, if deemed necessary.

For your welcome, Dr. Gibbes, in behalf of the Conference I most heartily thank you. There is no Board of Health in the United States which does not look upon Michigan as the source of its inspiration. Michigan and Massachusetts, par mobile fratribus, stand side by side in

this great fight, and in the front rank stands Detroit—the metropolis of Michigan, although not its capital—certainly deserving a share of our admiration. It would be altogether wanting in good taste if I should attempt to single out, among the names which have been presented to us in the beautiful sketch of the history of the board, anyone for special mention, but I would like to say that I think no one could read that sketch, and the brief biographical notices of the members of the Michigan State Board of Health, without being impressed with this fact: that the great majority of them are men of high culture, as evidenced by the possession of literary degrees on the part of a large proportion of them, and by their literary contributions of all to the great cause of sanitation. I do not think there is another such record in the State Boards of the whole country.

I thank you again, sir, for your kind words of welcome.

PROCEEDINGS.

The thirteenth annual regular session of the Conference of State and Provincial Boards of Health of North America opened in the ordinary of Hotel Cadillac, Detroit, Mich., at 9 a. m., Wednesday, August 10, 1898, the President, Dr. Benjamin Lee, Pennsylvania, in the chair. The Conference was called to order by Hon. Frank Wells, Chairman of the Michigan State Board of Health, after which prayer was offered by Rev. John McCarroll, of Grace Episcopal Church, Detroit. The address of welcome was delivered by Dr. Heneage Gibbes, Health Officer of Detroit, and responded to by the President, Dr. Benjamin Lee, of Pennsylvania. Secretary called the roll of the States, which was responded to as follows:

California—D. D. Crowley.
Connecticut—R. S. Goodwin, C. A. Lindsley.
Delaware—E. W. Cooper, R. G. Ellegood.
Illinois—J. A. Egan, C. B. Johnson, A. R. Reynolds.
Indiana—John H. Forrest, J. N. Hurty, F. W. Wynne.
Iowa—G. A. Guilbert, K. A. McKilbeen, H. Mathey.
Kansas—H. Z. Gill.
Kentucky—Dr. William Bailey.
Louisiana—Dr. Felix Formento, Dr. John Castellaneos.
Ohio—Byron Stanton, R. B. Kahle, J. C. Crossland, C. O. Probst.
Pennsylvania—Benjamin Lee.
Rhode Island—G. T. Swarts.
South Carolina—James Evans.
West Virginia—C. B. Benbaugh.
Wisconsin—Q. O. Sutherland.
Ontario—Peter H. Bryce, A. T. Rice.
Manitoba—J. A. Patterson.
Quebec—Elzear Pelletier.
Michigan—Frank Wells, Samuel G. Milner, Henry B. Baker, Frederick G. Novy, Fred R. Belknap, Delos Fall, Aaron V. McAlvoy.
Minnesota—H. M. Bracken.
New York—Dr. S. C. Jones.
Dr. C. O. Probst, Ohio, moved that any Municipal health officers present be accorded the privileges of the floor. Seconded by Dr. H. B. Baker, of Michigan, and carried.

Dr. H. B. Baker, Michigan, moved that any State vital statisticians present, such as Dr. C. L. Wilbur, of Michigan, be accorded the privileges of the floor. Seconded by Dr. C. O. Probst, Ohio, and carried.

PROGRAM.

First Session, Wednesday, August 10, 1898.

1. Call to order, Mr. Henry A. Haigh, Chairman Local Committee.
2. Prayer, Rev. John McCarroll, Detroit.
3. Welcome, Dr. Heneage Gibbs, Health Officer of Detroit.
4. Response on behalf of the Conference, President Benjamin Lee.
5. Call of Roll of the States and presentation of credentials of delegates.
6. Report of Secretary.
7. Report of Treasurer.
8. Reports of Committees.
9. Miscellaneous communications, suggestions, etc.
10. Answers by the represented Boards of Health to the questions suggested by Michigan: "What are the Principal Lines of Work of Your Board?" "How is Each Accomplished?" "What Modification, if any, does the Experience of Your State Suggest?"
11. Volunteer papers. Special discussions.

Afternoon, Wednesday, August 10, 1898.

To the members of the Conference, their ladies and guests, a cordial invitation is extended by Parke, Davis & Co. to partake of a luncheon which will be served at their laboratories at 12:30 p. m., immediately upon the arrival of the visitors. After luncheon ample opportunity will be afforded to inspect the firm's biological and pharmaceutical laboratories.

Immediately upon the noon adjournment members and guests will take trolley cars in Rowland street, on the east side of the Hotel Cadillac, for the ride to Parke, Davis & Co.'s. Members will please be prompt, as the cars cannot be kept waiting.

The trip of inspection is to be followed by a boat ride on the Detroit river and Lake St. Clair, this entertainment being provided by the Local Committee; the steamer will be in readiness at the dock in front of Parke, Davis & Co.'s establishment.

Evening Session.

This session will be of popular interest and will take the form of

A DISCUSSION OF THE PURIFICATION OF SURFACE WATER.

Discussion to be opened by Gardner S. Williams, Engineer of the Detroit Water Board, and by J. N. Hurty, M. D., Secretary Indiana State Board of Health.

Morning Session, Thursday, August 11, 1898.

DISCUSSION ON THE RESTRICTION AND PREVENTION OF TUBERCULOSIS IN ITS VARIOUS PHASES.

PHASE I. ETIOLOGY.

- (a) Direct cause—tubercle bacilli.
- (b) Indirect cause.
 - (1) Inherited predisposition.
 - (2) Depressed physical condition from bad hygiene, lack of physical culture, other diseases making favorable soil, etc.

Gardner T. Swarts, Rhode Island.

Discussion opened by J. A. Egan, Illinois.

PHASE II. MORBID ANATOMY. Showing its multifarious lesions affecting almost every organ of the body.

F. B. Wynn, Indiana.

Discussion opened by C. A. Lindsley, Connecticut.

PHASE III. IDENTITY OF TUBERCULOSIS IN MAN AND ANIMALS AND ITS WIDE DISTRIBUTION AMONG THE LATTER; ALSO ITS COMMUNICATION TO MAN THROUGH FOOD.

D. E. Salmon, Washington, D. C.

Discussion opened by George W. Harrison, Wisconsin.

REPORT OF THE WORK OF THE NEW YORK STATE BOARD OF HEALTH CONCERNING BOVINE TUBERCULOSIS.

By S. Case Jones, M. D., Rochester, N. Y., Chairman Tuberculosis Committee, New York State Board of Health.

Final Session, Thursday Afternoon, August 11, 1898.

PHASE IV. STATISTICS. Showing the proportion of:

Pulmonary Diseases in Man Due to Tuberculosis.

Intestinal Diseases in Man Due to Tuberculosis.

Diseases of Bone and Joints Due to Tuberculosis.

Diseases of Kidneys Due to Tuberculosis.

Diseases of Skin Due to Tuberculosis.

Diseases of Nervous System Due to Tuberculosis.

Diseases of Lymphatic System Due to Tuberculosis.

Byron Stanton, Ohio.

Discussion opened by R. S. Goodwin, Connecticut.

PHASE V. ECONOMICS.

(a) What is the annual pecuniary loss in the United States due to tuberculosis in man and animals?

(b) Does it in any way interfere with commerce and the public defense?

Wm. H. Brewer, Connecticut.

Discussion opened by Wm. Bailey, Kentucky.

PHASE VI. TUBERCULOSIS IN ITS RELATION TO NERVOUS DISEASES.

U. O. B. Wingate, Wisconsin.

Discussion opened by W. T. Miller, Ohio.

PHASE VII. HOW MAY TUBERCULOSIS BE PREVENTED?

(a) "Care of Expectoration." Chas. B. Johnson, Illinois. Discussion opened by George Gillett Thomas, North Carolina.

(b) "Disinfection of Houses, Buildings, Cars and Steamboats." P. A. Irving, Virginia. Discussion opened by Thos. C. Hoover, Ohio.

(c) "Prevention of Sale of Tuberculous Meats and Milk." H. M. Bracken, Minnesota. Discussion opened by Geo. G. Goff, Pennsylvania.

(d) "Ventilation and Outdoor Life." E. A. Guilbert, Iowa. Discussion opened by J. H. Hamilton, Vermont.

(e) "Reporting Cases" Felix Formento, Louisiana. Discussion opened by Solon Marks, Wisconsin.

(f) "How May the Objections of Physicians and People to Reporting Tuberculosis be Overcome?" Henry B. Baker, Michigan. Discussion opened by D. D. Crowley, California.

(g) "State and Municipal Care." S. A. Knopf, New York. Discussion opened by E. L. Standlee, Missouri.

(h) "What Position Shall State Laboratories Take in Respect to the Examination of Sputum?" Henry Mitchell, New Jersey. Discussion opened by H. M. Bracken, Minnesota.

ADJOURNMENT.

Secretary read his report, as follows, and, on motion, it was ordered received and filed:

SECRETARY'S REPORT.

The minutes of the last meeting, at Nashville, were given to the stenographer by the temporary Secretary. These the stenographer incorporated with the papers and the discussions, and he, after a delay of several months, due to an attack of typhoid fever, transmitted the complete record to the Secretary. As soon as bids could be obtained, five hundred copies of the report were printed and then distributed, ten copies to each of the following States, only those paying dues having reports sent to them:

California,	Quebec,	Michigan,
Connecticut,	South Carolina,	Missouri,
Illinois,	Texas,	New York,
Iowa,	Wisconsin,	Ohio,
Louisiana,	Maryland,	Pennsylvania,
Massachusetts,	Colorado,	Rhode Island,
Minnesota,	Delaware,	Tennessee,
New Hampshire,	Indiana,	Vermont,
North Carolina,	Kentucky,	Florida,
Ontario,	Maine,	Virginia.

There are now on hand 150 copies. The cost of printing five hundred copies of the report and five hundred advance circulars was \$175. The cost for distribution was \$7.60.

The Secretary, in accord with a resolution of the Executive Committee, addressed the following letter to all the State Boards of Health of the United States not heretofore participating in the Conference, also to all the States of Mexico, and all the Provinces of Canada, except Ontario and Quebec, the latter being omitted because they already belonged to the Conference:

Indianapolis, Ind., October 14, 1897.

Gentlemen—I have the honor to officially inform you that at the twelfth annual meeting of the National Conference of State Boards of Health, held at Nashville, Tenn., U. S. A., on August 18 and 19, 1897, the name of the organization was changed to Conference of State and Provincial Boards of Health of North America. This change was made to better express, in its title, the scope and aim of the organization.

The object of the Conference is to bring together the legally empowered workers in sanitation on this continent, to discuss the questions that are of special interest in their work, to help solve embarrassing questions, and to bring, as far as possible, uniformity in methods and corporations of Boards of Health with one another. All State and Provincial Boards of Health are cordially invited to authorize the Secretary of the National Conference to subscribe their names to the roll of membership, and to send delegates to the next meeting, to be held in Detroit, Mich., U. S. A., date of meeting to be given.

I hope an early reply will be received announcing that your Board will enter membership in the Conference.

Very respectfully,

J. N. HURTY,
Secretary National Conference.

From Mexico but one reply was received, the same being from the State of Mexico, accepting membership. Of the Canadian provinces, replies came from Manitoba and New Brunswick, both accepting membership.

Number of letters received by the Secretary, 210; number of letters written by the Secretary, 380.

Concerning the programme before us: Letters were early sent to all Boards of Health heretofore participating in the Conference, asking each to propose a subject for discussion. The replies were so few, and as only one or two Boards offered questions, it became necessary for the Executive Committee to take action. The Secretary therefore proposed that the sanitary control of tuberculosis be taken as the topic for our last day. Accordingly, letters setting forth the proposition and order of treatment were sent to all the Boards, and as out of many replies only one opposed the plan, the same was adopted.

DR. IRVING'S SUGGESTION.

Dr. Paulus Irving, of Virginia, who regrets his inability to be present, respectfully recommends that a permanent place of meeting for every other year be adopted by the Conference. He suggests Washington, D. C., and argues that "the advantages would be many, especially if Washington were selected." "The attendance," he says, "would almost certainly be better, because all the States could count on a certainty two years ahead." Dr. Irving further suggests that "as we are a working body, that all entertainments be done away with."

This Conference, under its present name, is probably without a Constitution. One was adopted by the National Conference of State Boards of Health at its birth, but the same was not readopted at Nashville, and the whole matter was passed in silence when a change was made in name and in the scope and purpose of the association. I propose, therefore, the formal adoption of the following Constitution:

Conference of State and Provincial Boards of Health.—The name of this association shall be the Conference of State and Provincial Boards of Health.

Membership.—The members of this Conference shall be the executive officers and other delegated representatives of the State Boards of Health of the United States, the State Boards of Health of Mexico, and of the Provincial Boards of Health of the Dominion of Canada.

Dues.—Each Board represented shall pay to the Treasurer of the Conference, annually, the assessment deemed sufficient to meet current expenses and arrears, if any.

Votes.—Whenever demanded by two delegates, any question shall be determined by a vote, each State being entitled to one vote.

Officers.—The officers of this Conference shall be a President, Vice-President, Treasurer, and Secretary. The duties of each officer shall be those which are usually performed by such officers, and collectively the officers shall be an Executive Committee, to make suitable provisions for meetings of the Conference, for programme, etc.

It was moved by Dr. William Bailey, Kentucky, that, in accordance with the recommendation of the Secretary, the old Constitution should be adopted as the Constitution of the Conference of State and Provincial Boards of Health of North America. Seconded and carried.

Dr. James Evans, South Carolina, moved that the recommendation of Dr. Paulus Irving, Virginia, that the Conference should meet every alternate year in Washington, D. C., be adopted. Seconded by Dr. Brackin, of Minnesota. Its consideration at this time being ruled out of order, Dr. Evans moved to

appoint a committee to consider this question. Seconded and carried.

It was voted that the Chair appoint the committee, whereupon he appointed Dr. James Evans, South Carolina; Dr. Henry B. Baker, Michigan; Dr. Gill, Kansas; Dr. Elzear Pelletier, Montreal; Dr. P. H. Bryce, Ontario.

Treasurer's report was read, as follows, and, upon motion, referred to Dr. Probst, Ohio, and Dr. C. A. Lindsley, Connecticut, as Auditing Committee, with instructions to report Thursday morning.

**FINANCIAL STATEMENT OF THE TREASURER OF THE CONFERENCE OF STATE
AND PROVINCIAL BOARDS OF HEALTH OF NORTH AMERICA, FROM
AUGUST 19TH, 1897, TO AUGUST 10TH, 1898.**

Preliminary Statement.

Debts remaining unpaid on August 19, 1897 (Nashville meeting):

German-American Printing Co., balance of printing.....	\$78 50
United States Express Co.....	37 86
Stamps	50
• Ontario Board, balance of expenses of their Secretary while acting on Quarantine Commission in 1892.....	90 00
Kentucky Board, balance of expenses of their Secretary while acting on Quarantine Commission in 1892.....	151 00
 Total.....	 \$357 86
Deducting cash in hands of ex-Treasurer.....	87
 Net.....	 \$356 99

RECEIPTS

From August 19, 1897, to August 10, 1898.

Cash from ex-Treasurer.....	\$0 87
Dues of 1894 from Iowa and Maine, each \$15, and from Michigan a balance of \$5.....	\$35 00
Dues of 1896 from California, Colorado, Connecticut, Minnesota, New Hampshire, New York and Tennessee; each \$10.....	70 00
 Total arrears received	 105 00
Dues of 1897 from Alabama, Colorado, Connecticut, Delaware, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New York, North Carolina, Ohio, Ontario, Pennsylvania, Quebec, Rhode Island, South Carolina, Tennessee, Texas, Virginia and Wisconsin; each \$15.....	405 00
Dues of 1897 <i>partly paid</i> from California, Florida, Missouri and Vermont; each \$10	40 00
Interest on bank deposit.....	86
Amount <i>overpaid</i> by Louisiana	5 00
 Total receipts.....	 \$556 73

PAYMENTS.

From August 19, 1897, to August 10, 1898.

H. L. Andrews, stenographer, Nashville meeting.....	\$71 90
Stationery—Morton Philips, \$1.40; W. F. Daniel, \$3.00; W. B. Burford, \$8.50.....	12 90
Printing—Carlton & Hollenbeck, Nashville proceedings, \$170.00; Carlton & Hollenbeck, preliminary circular Detroit meeting, \$5.00; W. F. Daniel, circular, \$4.00.....	179 00
Postage stamps—To Secretary of Conference for correspondence and mailing proceedings, \$14.19; to Treasurer of Conference, correspondence, \$9.74.....	23 93
Bank charges for collecting thirty-seven checks, refunded to Treasurer (10 cents each check)	3 70
U. S. Express Co., distribution of proceedings.....	4 35
 Total current expenses	\$295 78
German-American Printing Co., balance on printing Chicago proceedings	\$78 50
Columbus agent U. S. Express Co., distribution Chicago proceedings.....	37 86
To ex-Secretary-Treasurer, for stamps.....	50
Ontario Board, balance of expenses of their Secretary while acting on Quarantine Commission in 1892.....	90 00
Kentucky Board, part payment of expenses of their Secretary while acting on Quarantine Commission in 1892.....	49 09
 Debts of former years paid in full or reduced.....	255 95
Amount overpaid by Louisiana and refunded.....	5 00
 Total payments.....	<u><u>\$556 73</u></u>

En resume: Your Executive Committee has collected, since the Nashville meeting, \$551.73 (deducting \$5.00 refunded), and it has been thus enabled to pay all of its current expenses (\$295.78), and to reduce the debts remaining unpaid at the Nashville meeting from \$356.99 to \$101.91.

To help the collection of assessments, I would suggest the Conference to enact the following rules:

I. Any Board neglecting to pay its annual dues, after a request made by registered letter, will be considered as having resigned. Any such Board, however, will be readmitted at any time on paying two years' arrears.

II. State and Provincial Boards having an annual grant of less than \$2,000 will have only to state the fact when they receive their bills of dues to have the assessment against them canceled.

III. Members of the Conference will have to pay the assessment whether they were present or not at the meetings of the Conference.

The reason for the first and second rules is obvious. As to the last, it is necessary to pass it; otherwise, should all the Boards not represented at a meeting abstain from paying the assessment, we would have to give up printing our proceedings. As the absentees will get our proceedings, same as those who were present, they cannot complain of the proposed regulation being unfair to them.

Respectfully submitted,

ELZEAR PELLETIER,
Treasurer.

Dr. C. O. Probst, Chairman of Committee appointed to audit the Treasurer's report, in due time stated that the same had been

found correct, and that the committee recommended the adoption of the suggested rules governing the collections of assessments which were submitted in the report.

On motion, it was voted that the audit be accepted and the rules be adopted.

Upon motion of Dr. C. O. Probst, of Ohio, seconded by Dr. H. B. Baker, Michigan, it was voted that the thanks of the Conference be extended to the Treasurer for the faithful performance of his trust and duties, which vote of thanks was responded to by the Treasurer, Dr. Pelletier.

The President appointed Mr. T. R. MacClure, of Detroit, Assistant Secretary.

The Secretary read a communication from the Mt. Clemens authorities extending an invitation to the delegates to visit that resort, and to also indulge in the baths.

Dr. H. B. Baker, of Michigan, stated that the invitation which the Secretary had just read had been handed to him by the Secretary of the Convention League of Detroit, and that if the members could not visit Mt. Clemens in a body, that provision would be made for escorting small parties.

On motion, the invitation was accepted, with thanks.

The President stated that the acceptance of the invitation would not make it compulsory upon any delegate to take a bath if he did not want to. [Laughter.]

On motion of Dr. Gardner T. Swarts, Rhode Island, Dr. C. L. Wilbur, Chief of Division of Vital Statistics, Michigan, was accorded the floor and spoke as follows:

"Those of you who are members of the American Health Association know that for the past four years a uniform classification for the causes of death has been under discussion. Last year the committee on nomenclature and form of certificates recommended that the Bertillion system should be adopted as the system to be used by all registration offices in Mexico, Canada and the United States. The system has already been adopted and is in practical use in Mexico. It has been adopted in Canada during the past year, in the Province of Ontario, upon recommendation of the Registrars in the Dominion Census. Of the three countries, the United States, Mexico and Canada, two of these have practically expressed themselves on this question. There only remains its adoption by the United States, or by the several States of this country, for its complete prevalence on this continent. It has already been adopted by the States of Michigan, Vermont, Indiana and Maryland; and the States of Minnesota, Connecticut, Rhode Island and Maine ready to adopt it as

soon as action is definitely taken by this association. I therefore offer the following resolution:

"Resolved, That the Conference of the State and Provincial Boards of Health of North America recommends the adoption of the Bertillion classification of causes of death as soon as such change may be conveniently made from the systems in use in registration offices.

"The word 'convenient' is of great importance. It is not desirable for a city or State which now has a fairly satisfactory system in use to make the change at once. It might be better to wait a year or two. There is a prospect that this system will be revised by action of the registration officers. But for a State that wishes to adopt a system now, it is recommended that it adopt the Bertillion system as it now stands, and as it has been adopted by the States of Michigan, Maryland and Indiana."

Dr. C. A. Lindley, Connecticut: "I regard this resolution as a very important matter, and I hope it will receive the sanction of the Conference. It seems to me most desirable that there shall be some uniform method adopted to facilitate comparison between States. I think this matter needs no argument, and I move the adoption of the resolution."

Motion seconded.

Dr. P. H. Bryce, Toronto, Can.: "I also consider this an important matter. I think we all recognize the fact that the systems used in the census of the United States and of Canada during the last two decades were very unsatisfactory. While I most heartily favor the adoption of the resolution, I think it should either be enlarged upon or a new resolution made, containing the recommendation of the Conference to the United States government and the Canadian governments that the United States census of 1900 and the Canada census of 1901 be based upon this system of classification. We all know that in matters of government the individual opinion of the officer of the bureau naturally stands for a great deal, but we have no doubt that such officers would recognize what we recognize, and that is, the desirability of having our census returns comparable in every respect. Mr. President, I move that the resolution be amended by adding that the governments of the United States and Canada be asked to adopt the Bertillion system in the coming census of the United States in 1900 and in Canada in 1901."

Dr. C. L. Wilbur, Michigan: "I most heartily accept that amendment. The only reason I did not incorporate something similar in my original resolution was because I feared it might be too far-reaching."

Dr. W. B. Baker, Michigan: "Might I not suggest that the amendment proposed by Dr. Bryce include the United States of Mexico?"

Dr. Bryce: "Certainly, if it has not already been adopted in that country. As I understand it, I think the system is already in use in that country."

The President: "The Chair begs leave to ask Dr. Bryce to offer his amendment as an original motion. The motion recommending the adoption of the resolution has been seconded, and if there are no further remarks a vote will be taken."

By vote, the resolution was adopted.

Dr. Lennares, Louisiana: "I move that the Secretary notify each and every board in affiliation with this Conference of the action just taken with reference to vital statistics, and that this notification be accompanied with a full explanation of the subject. My reason for offering this motion is because there may be some who do not understand the system thoroughly. I consider something of this kind necessary in order to fully carry out the intention of the resolution."

The motion was seconded, and, upon vote, carried.

Dr. P. H. Bryce, Toronto, Can.: "In view of the adoption by the Conference of the State and Provincial Boards of Health of North America of the resolution recommending the adoption of the Bertillion classification of disease, I move that the governments of the United States, Mexico and Canada be likewise requested to make this classification the basis of their mortality census in 1900 and 1901."

Motion seconded and carried.

Dr. James Evans, South Carolina: "As Chairman of the committee appointed to consider the recommendation that the Conference shall meet in Washington, D. C., each alternate year, I desire to report that the committee has held a meeting, and that we endorse the recommendation."

The President: "I accept the report of the committee, and will bring it before the Conference at the proper time."

The next order of business was answers by the represented Boards of Health to the questions suggested by Michigan: "What are the Principal Lines of Work of Your Board?" "How is Each Accomplished?" "What Modification, if Any, Does the Experience of Your State Suggest?" The roll of States was called in alphabetical order, that the representative from each State might have an opportunity to be heard. The first to respond was Dr. D. D. Crowley, of California, who spoke as follows:

"Mr. Chairman and Gentlemen—The principal work that we are doing in California at present is an effort to prevent the entrance of tuberculosis into our State. We have come to the conclusion that our State has been so great a sanitarium for this disease, and that it is doing us a great deal of harm. We are making a strong effort to prevent its getting a greater foothold than it has now. Another effort is being made to wipe out tuberculosis so far as cattle are concerned. The cattle men, however, are very wealthy, many of them being millionaires, and they defeat every sanitary measure which we ask the Legislature to pass. At the last session of the Legislature we endeavored to pass a law to have all milch cows examined, but they defeated it. I am speaking now of tuberculosis. In addition to this, we are trying very hard to keep Texas fever from obtaining a foothold in our State. It is believed that Texas fever is propagated by the tick. It has been suggested that the State of California should employ an expert veterinary surgeon to act in unison with the Board of Health, and in this way do away with the quarantine laws. I suppose the State of California is absolutely quarantined from all other States—from Oregon, Nevada, Arizona, from Mexico—and therefore, while cattle can come into this State, they cannot be shipped out again. We also have quarantine laws across the State to prevent Southern cattle passing to Northern cattle. There is another matter which is also engaging the attention of the California State Board of Health. We have land quarantine, which will prevent any contagion entering the State by land, but we have no control over the harbors. The Chief of the Marine Hospital Service, Dr. Wyman, is supreme here. I feel that he has usurped power that should be vested in the State Board of Health. So, while we can guard against the approach of disease by land, and secure statistics regarding disease coming that way, we know nothing about disease coming in by ships—by steamers—and it places us in a very awkward position. We feel that we should have control of our harbors.

"These are the matters which are engaging the attention of the State Board of Health of California. I should be glad to receive suggestions from the members of this Conference regarding these matters. At the present time we are in somewhat of a quandary."

THE CONNECTICUT STATE BOARD OF HEALTH.

DR. C. A. LINDSLEY, NEW HAVEN, CONN.

The principal lines of work of our Board are three: First, the establishment locally of an effective and trustworthy sanitary administration in every town, borough and city in the State; second, the work of securing, preserving and tabulating the fullest and most accurate vital statis-

tics possible; and third, a careful chemical and microscopical examination of the natural waters of the State, including wells, reservoirs and running streams. These are the three most prominent objects our Board is aiming to accomplish. Our success in either of these directions has been marked by slow and inconstant progress to such results as have been attained. Our Board is endowed with only advisory powers, and cannot undertake aggressive sanitary work, except as specifically directed by special legislation. Some State Boards have broader powers conferred upon them.

In the matter of organizing local sanitary administration in towns and cities, it has been a growth rather than an event, an evolution, the result of careful cultivation of some small germs in the public mind of stunted development and exceedingly frail vitality. At the time of the organization of the State Board of Health of Connecticut there was not one really efficient active local Board of Health in the State. It is true the people appreciated in a theoretical way the utility of a Board of Health, and provided by statute that in every town the "selectmen" and the justices of the peace shall constitute a Board of Health. But it was understood on all sides that their principal functions were to build as good bridges as the town could afford, keep the roads in repair, farm out the town paupers at the lowest possible cost to the town, get out the full party vote on election days, and if any cases of smallpox occurred, hire the cheapest doctor and some pock-marked parties to take care of them in the pest house. Such was the situation as regards public hygiene generally throughout Connecticut twenty years ago.

It was at once quite evident to the State Board that some new legislation would be necessary to any satisfactory improvement, and some futile efforts to impress the Legislature with the importance of the subject were made. A pumpkin hurled at an ironclad battleship symbolizes the impress upon the Legislature at that time. We learned once for all that sanitary reforms cannot be inaugurated in a Legislature. Kepler's laws of the planetary motions are not more unalterable. The law governing Legislatures is: Follow in sanitary matters—never lead. One reason is, there is no party politics in scientific hygiene. Another reason is, legislators are not sanitarians. The key to sanitary legislation is: Begin behind the Legislature—among the people who make legislators. Our experience is, I believe, in accord with the experience of all other States: that judicious hygienic laws have their foundation in an enlightened public sentiment. And that enlightenment must precede legislative enactments. Guided by these considerations, the State Board of Health of Connecticut has pursued the same methods which have been found necessary everywhere else as a prelude to the organization of practical public hygiene. Educate the people. Convince the common people, and especially the voters, that they have a personal and pecuniary interest in the public health. It is a tedious process; the progress is slow and often discouraging. It is like teaching school when there are more truants than attendants, and when the pupils question your authority and disrespectsfully resist your teachings. But "precept must be upon precept, precept upon precept, line upon line, line upon line, here a little and there a little," and with patience and perseverance old prejudices are eventually overcome, deep-rooted conservatism is gradually loosened, and new ideas get a lodgment. I will not detail the steps of such instruction. It is something that must be done, however it may be done best. Suffice it to say that in Connecticut, after twenty years of work, largely in the educational line, practical public hygiene has reached its present stage of advancement.

Permit me briefly to outline the prominent features of the present system of health administration in our State. One of the most satisfactory changes has been the elimination of party politics from this department of the public service, and the lengthened tenure of office of health officers

everywhere. They are no longer elected annually by popular vote, and consequently health officers need waste no time to repair political fences. We have, too, an official in Connecticut which is, I believe, peculiar to our State, and his analogue does not exist anywhere in the Union. He is a county officer. He must be an attorney at law. He is misnamed a county health officer, but his duties are executive, not sanitary. He is charged with the enforcement of the laws relating to public health, and those also relating to the registration of vital statistics. He appoints all town health officers, and can remove them and fill vacancies.

The health officers of the cities and boroughs are appointed according to the terms of their respective charters, but all are appointed for four years, instead of every year, as formerly, and none of them by the popular vote.

The health officer of each town is empowered to make local sanitary rules and regulations for his own town, which, after being officially promulgated, have the force and validity of law. In cities and boroughs, of course, their respective charters provide for the enactment of local ordinances. Under the advice of the State Board and of the county officers, who are attorneys at law, a code of sanitary regulations for towns has been drawn up, and by concurrent action and mutual agreement has been adopted by all the health officers, so that one system of rules prevails everywhere in the State, except in incorporated cities and boroughs.

The county officers are required to make an annual report to the State Board of their doings in each county. The local health officers also make annual reports to the Board for their respective localities.

By an act of the last Legislature, every physician is required to report promptly to the health officer of his town the usual list of contagious diseases occurring in his practice. And during the first week of the following month the health officer is required to report the same to the State Board. He is also required to report immediately the outbreak of any epidemic. In addition to these sources of information, the registrar in every town is required to report during the first week in every month the total mortality in his town in the month preceding, together with the number of deaths from each of the most fatal diseases. By these means the State Board of Health is kept pretty closely in touch with the condition of public health in every part of the commonwealth, and publishes the result in a monthly bulletin.

The special distinguishing feature of our system is that these laws are effective. The reports are made, both by the health officers and the registrars and the doctors; they are made promptly. It is quite easy to make laws that would fulfill every requisite if they were obeyed. Their failure is due to non-observance. Registrars, health officers and doctors all neglect them if left to themselves. The real question is, How can obedience be secured? Connecticut has solved that problem, and given the only practical solution that has ever been offered. It is an exceedingly simple matter merely to impose upon one competent person in each county the duty of seeing that these legal requirements are observed. Personal supervision of their operation is as essential as the engineer is to the action of the locomotive. They will not work automatically. It is a remarkable illustration of legislative credulity to believe that laws so complicated, involving the concerted and periodical joint action of so many persons of varied occupation, would be carefully and uniformly observed without official oversight. They never have been so observed, and they never will be, except under supervision similar to that which Connecticut has provided. The supervision must be direct, vigilant and continuous. Every month each county officer notifies every delinquent in his county, whether he be doctor, registrar or health officer, that a repetition of his neglect will be followed by a prosecution. This is effective. There is a point to such notices that is appreciated.

The compensation of these officials is regulated by law, and is for

service per diem. The county health officer is paid by the State at the rate of \$10 per day and expenses. The town health officer is paid by his town. It is the only bill concerning which the town has no option. It must be paid by the treasurer, if audited and approved by the county health officer. The State, however, knowing the propensity of doctors to undervalue their services, has with paternal regard provided that the pay shall not be less than \$3 per day.

ABATEMENT OF NUISANCES.

As regards the abatement of nuisances and the maintenance of sanitary conditions, the local officers are the executive, the supreme authority in their own towns. Any person aggrieved, however, by the order of a town health officer may appeal to the county officer, who, upon investigation, may vacate, modify or affirm the order of the health officer. These are always purely local conditions, in which the local health officer is the proper executive, acting in doubtful circumstances as to authority under the legal advice of the county officer, and in sanitary questions under that of the State Board of Health.

VITAL STATISTICS.

Our system of collection is townwise. In Connecticut every city and every borough is within the limits of a town. The town clerk in each town is the registrar of vital statistics of the town and the included city or borough. He issues permits for burial or removal of the dead only upon receipt of certificates of death legally presented. All doctors and midwives make returns during the first week of each month of all the births they have attended during the preceding month. Clergymen and others authorized to perform marriage ceremonies are also required to certify to the same each month to the registrar. Previous to the appointment of the county officers the regular performance of this duty was neglected by the great majority of those upon whom it devolved. A few prosecutions by the county officers, and the consequent penalties paid, have worked an astonishing reformation, and have speedily converted law-breaking clergymen, law-defying doctors and ignorant midwives into good, law-abiding citizens.

The improvement in the assembling of the vital statistics of the State is, in consequence, as nearly complete as is possible by any method. Another valuable feature of our registration work is the rendering to the State Board of Health in the beginning of every month a true copy of each certificate of birth, marriage and death occurring in the preceding month. The law requiring this has been in operation only since the first of July, 1897. The copies are made on cards and preserved at the central office, in the method known as the card system. In this way are gathered into one office the attested copies of every birth, marriage and death occurring in the State. These are so systematically filed that the name of any person in a given town can be found without delay.

EXAMINATION OF THE NATURAL WATERS OF CONNECTICUT.

The special investigations of the Board of Health concerning river pollution and public drinking water begun in 1886 as the result of an act of the Legislature providing for investigations concerning river pollution. Attention was first directed to a statistical inquiry into the amount of polluting material discharged into the several rivers known to be subject to a considerable contamination, and to facts relating to the area of watersheds and the flow of the streams. This inquiry resulted in the collection of much material of interest, not only concerning the amount of polluting material discharged into the streams, but also concerning the nature of the chemicals used and discharged as waste material in some of the chief manufacturing industries of this State, especially certain of the metal industries and the manufacture of paper, silk and woolen

goods and hats. The results of these researches were published in the tenth and eleventh annual reports.

During the time devoted chiefly to these industries, chemical and bacteriological examinations were made of the waters of some of the streams. The attempt to interpret the results of these analyses demonstrated at once a lack of that definite knowledge of the normal waters of the State which is necessary to serve as a standard by which to determine the amount of contamination in a polluted water. While, therefore, examinations of the polluted waters were continued, analyses were also made of unpolluted waters, with the view of establishing standards for the various parts of the State, so far as this is practicable.

The source of the samples for this class of analyses was for the most part the public drinking water of the State, care being taken, of course, to select protected supplies. In these examinations attention was directed not only to those points concerning which comparative information was wanted, but also and especially to those having sanitary interest. The examination of the public drinking water supplies have included chemical and microscopical analyses, and in some cases bacteriological counts also, and, where practicable, an examination of the surroundings of the source of supply.

The chemical methods have been those of the ordinary sanitary analysis, such as experience has demonstrated to be of practical value, and, for the benefit to be derived from uniformity in reports, have been made to conform in their general features to those used in the work done under the direction of the neighboring State of Massachusetts.

The biological or microscopical analysis has consisted in the identification of the genera of the organisms not bacteria, and an estimation of the number of individuals of each in a given volume of water. The Rafter-Sedgwick method of sand filtration has been used.

In the earlier analyses, estimates of the number of bacteria, as determined by the methods of plate-culture, were made in samples specially collected and sent to the laboratory in an ice packing. The unsatisfactory conditions of collection and transportation, together with the variable results obtained, led to the abandonment of bacteriological determinations, except in special cases.

The systematic examination of our public water supplies, and the publication of the results, is believed to have been of great value to the State, especially by stimulating efforts on the part of the water officials to improve the quality of the water furnished by greater care in the management and oversight of reservoirs and watersheds.

In connection with the examination of sewage-polluted streams, attention has naturally been directed to the composition of sewage and the methods of purification. Accordingly, analyses have been made of crude sewage and of the effluent from filter beds. Mechanical analyses of samples of sand have also been made from all of the filters in those places where the purification of sewage by sand filtration has been adopted.

In consequence of these investigations relating to the purity of water and the proper disposal of sewage, public attention has been specifically directed to their importance as a factor in public health, and the following towns and cities have constructed filter beds for the disposal of sewage by land filtration: Meriden, Bristol, Danbury and Litchfield, and others are seriously studying the problem for immediate purposes.

The foregoing are the three prominent objects which the State Board of Connecticut is striving to accomplish, to-wit, good sanitary administration for every community in the State; an accurate and full record of the vital statistics of the State, and a careful inquiry into the natural waters of the State and of the dangers of contamination. The legislation of Connecticut in regard to these objects is now in a fairly satisfactory condition, and, excepting in some matters of detail, is promotive of our efforts. Of these it is not necessary to speak, as they concern only our own work and our own State.

STATE BOARD OF HEALTH, CAMDEN, DELAWARE.**DR. E. W. COOPER, PRESIDENT.**

The State Board of Health of Delaware, by its act of incorporation, passed March 13, 1879, is required to meet semi-annually, and at such other times as may be deemed necessary by the Board. It is made the superintendent of the registration of vital statistics, and has full power of action, prompt and efficient, in emergent or ordinary cases, on its own inspection, or on notice or grievance made to it, without the right of appeal from its decisions, though, of course, responsible for its work. In answer to the queries submitted:

First. Our line of work is two-fold, embracing the direct and immediate care for the general sanitary conditions by a general inspection of the State twice a year, especially in the spring; the fall inspections are more especially of the school houses and grounds and all public buildings. These inspections are limited somewhat by the amount of State appropriation. All our towns are required to have local Boards of Health, with the same power to act in all cases as the State Board; they are also compelled to report to the State Board when required, their action being confined to their several localities; and wherever or whenever they do not act promptly, the State Board at once supersedes them, taking the matter at once out of their care, and applies the remedy to the condition. And secondly, we endeavor to educate the masses of the people by circulars on important practical subjects adapted to their power of comprehension of the matter, and by holding meetings in different parts of the State in connection with the local board and town officials, thus giving the information orally. This latter is yielding its results in more frequent calls upon us, in more prompt obedience to our mandates and suggestions, and, by popular support, has secured more liberality of appropriation for the work.

Second. We accomplish our work by an officer who makes the canvass, and by the personal response by the members of the Board to any call made upon them by the general direction of the Board, or of its executive officers in President and Secretary.

Third. We have endeavored to secure general control, for sanitary purposes, of the streams and waterways of the State, to secure a more thorough inspection of milk and other food materials, and to secure a better system, more accurate, of reporting sickness, as well as fuller and more reliable vital statistics. Our people are more fully realizing the great advantage of our work in the promotion of health and saving of life, and we hope at our next legislative session to secure their suggested changes by the demand of the people on the lawmakers.

ILLINOIS STATE BOARD OF HEALTH.**DR. J. A. EGAN, SPRINGFIELD, ILL.**

I regret to state that the principal line of work of the Illinois State Board of Health is in connection with the enforcement of the Medical Practice Act, the duties pertaining to which have so increased during the past few years that the Board has really become one of Registration and Examination. It is earnestly hoped that before this Conference again convenes, the law will be so changed that the Board will have an opportunity to perform its legitimate functions. Notwithstanding that for years the Board has recommended the enactment of a law creating a State Board of Medical Examiners, to examine and license physicians and midwives, all efforts to obtain the desired legislation have been futile. There are, however, excellent reasons for believing that relief will be obtained during the coming year.

As an illustration of the duties devolving on the Board incidental to the act referred to, I will state, that during the past year the Board has

issued licenses to eight hundred and seventy-five physicians on presentation of diplomas, and has examined thirty-five physicians whose diplomas were not accorded recognition. Fifty non-graduates in medicine and seventy-five midwives were also examined. During the same period the Secretary answered eleven thousand four hundred and seventy-three communications, and the Board instituted prosecutions against ninety-four violators of the Medical Practice Act, and took steps whereby over one hundred more were compelled to desist from practice. Of course, the above represents only a part of the duties occasioned by the act.

Aside from the maintenance of an efficient inspection and quarantine service at Cairo and other points in the southern portion of the State, from September 7th, the date on which the yellow fever was announced as existing in New Orleans, to the 7th of November, when the disease was entirely stamped out in Memphis, one hundred miles south, very little outside of the ordinary routine work has been done by the Board in the line of sanitary investigation during the year. Whenever it has been found necessary or desirable, local Boards of Health have been assisted in the conduct of sanitary measures. All epidemic outbreaks throughout the State, have been promptly investigated, and wherever no local Boards of Health existed efforts have been made to have such established. In addition, several thousand circulars on the prevention of diseases have been distributed. The sanitary condition of several State institutions have been inspected, and in connection with the University of the State, analyses of the water supplies of the State have been made.

Owing to a decision of the Supreme Court of the State adverse to the Board, no attempt has been made to enforce the school vaccination order, and on account of defects in the law creating the Board it has been found impractical to obtain any system of vital statistics.

The existing conditions can be little bettered until legislation is obtained. The creation of a State Board of Medical Examiners is absolutely imperative, and sanitation would be much better promoted were laws also enacted establishing local Boards of Health, making the appointment mandatory, not optional, as at present.

REPLY OF INDIANA TO THE QUESTIONS PROPOUNDED BY DR. BAKER:

"WHAT ARE THE PRINCIPAL LINES OF WORK OF YOUR BOARD? HOW IS EACH ACCOMPLISHED? WHAT MODIFICATION, IF ANY, DOES THE EXPERIENCE OF YOUR STATE SUGGEST?"

By J. N. HURTY, SECRETARY OF INDIANA STATE BOARD OF HEALTH.

The State health law of Indiana, among other good things, contemplates the collection of accurate vital statistics. A few cogs were, however, left out of the statistical part of the machine, and several wheels fail to connect, and therefore statistical work of value cannot be done. Still, the law contains some good machinery and with it a certain grist may be ground. The Indiana State Board of Health has therefore obeyed the law in registration matters to the fullest degree possible, but its best work is in another direction. As it is a duty of the Board to visit all parts of the State, giving advice and direction to the people in sanitary affairs, this line has been followed to the fullest extent of our legal and financial strength.

One section of the law makes all health officers in the State subordinate to the State Board, and gives the State Board power to order sanitary improvements at any place. Another section says—"they," the State Board, "shall have power to regulate and prescribe the location of plumbing, heating, ventilation and disposal of excreta in all public buildings." These duties and powers make a wide field for endeavor, but as

the ways and means bill cuts the office force down to a Secretary and one clerk, and gives a salary to the Secretary for only one-half time, it is possible after all to accomplish but little. We, therefore, do no statistical work of value and our efforts in educating the people in disease prevention by pamphlets, by persuasion and by arbitrary orders, is the only line in which we can work with any measure of success. In order to discover where sanitary conditions are unsatisfactory to the people, a letter was issued informing the public that the State Board would send its representative to any part of the State to help in all sanitary improvements which investigation showed to be desirable. The responses were numerous. Letters were received from citizens everywhere, telling of nuisances, giving information of delinquencies in the health service and asking for help. Applications came from the authorities of cities and towns for aid in such number as to swamp us. At the present time over two hundred and fifty places are listed to be visited. It is obvious that the one State health officer, paid, please remember, for only one-half his time, cannot meet the demand. We, however, do the best we can and we feel much good work has been done. As instances, the following two accounts will suffice:

FIRST INSTANCE.

A farmer from near a small town, within one hour's railroad ride of Indianapolis, one day called at the office of the Board. He introduced himself and told his mission. His locality was sorely plagued with typhoid fever. In three years in his school district 75 per cent of the people had had typhoid fever and 8 per cent. had died. The people were financially prostrated. Their money had been spent for the cure of disease and in several instances, taxes could not be met. In one instance, with the exception of the father, a whole family—wife and three sons—were swept away. This father, when visited, was found sitting alone in his desolate house on the verge of insanity, and from which awful end, he was with difficulty, rescued. The sons had been educated by the State and had just entered the productive period of life. A wife and mother was slain, and thus a family—the very foundation of all society—had been needlessly extinguished. It was obviously a proper and good work for the State to look into such conditions.

The first step taken was to call the stricken community together at the church, and there tell them with great plainness, that "like sin, typhoid was a reproach to any community." After explaining the whole matter, how typhoid was water borne, and how it got into the water, and going farther into household hygiene, a local sanitary society was organized to co-operate with the health authorities. The crusade then commenced. Every house in that district was visited, both the stricken and unstricken being looked after. The well waters were all analyzed and the polluted wells abolished. Premises were cleaned, buildings repaired and renovated, earth closets established, cellars drained and new driven wells put down. Two years have passed, and typhoid and other bowel disorders are now unknown in Rocklane.

As a last chapter to this account, it will be of interest to state, that we had much evidence pointing to the conclusion that the well at the little country church originally contained the poison which had played such havoc. The water from this well was found to be high in free and albuminoid ammonia and nitrates. It grew readily in carbol-bullion and from it the colon bacillus was easily separated. At least, what was believed to be the colon bacillus was found, at any rate, the incubator in which the cultures grew, had a pronounced fecal smell. How the infection could possibly have reached the well, is an unsolved problem, but it is sad to think that the good people should have found disease and death while in attendance at worship.

Sanitary work done in another instance was as follows: A letter was received from a town of 5,000 inhabitants, telling of bad sanitary conditions in the public schools. A visit discovered that the building was very old, proper ventilation never had existed, the lighting was improper in many rooms, but the great trouble lay in the fact that the ventilating heaters which received air from outside the building, and after warming distributed it throughout the rooms, had been replaced by open "gas radiators." These gas radiators were flimsy affairs, made of sheet iron and having an asbestos back against which the flame impinged. There was no connection with the flues and consequently the products of combustion were delivered into the already vitiated air. The consequences were exactly what were to be expected. The children were made dull, stupid and sleepy, and coughs, colds and headaches were abundant. Upon several occasions, pupils were partially overcome, but always quickly revived when taken to an open window. The principal declared—"This condition is ruining our school." Of course it was, and the wonder was, how could it be that three successful, so-called practical business men, who composed the school board, could have done such a thing. And the wonder grew, when we found two physicians and several citizens of the town who forcibly expressed themselves as of the opinion that, "no harm was being done, for the local accounts showed no unusual sickness and the school attendance was not lowered." In relieving this condition, the State law had to be invoked, for persuasion with the local authorities, failed.

In our innocence, we concluded that we had but to clearly explain how the poisonous products of combustion further vitiated the already heavily laden air, and was bound to do great harm to the pupils. Authorities were quoted to sustain our contention, and strong appeals were made, but the school board would not act, and a local newspaper attacked the State Health Board viciously, as a meddling nuisance. Here was a case for education by law, and the law was applied.

Under the directions of the Attorney-General, a formal order was issued and steps taken to enforce the same, through the courts. The Town School Board then sought legal advice and eventually yielded. The final result of the agitation was very good. That town is now building a modern schoolhouse with special attention to all sanitary conditions and the people greet the State health officer as a benefactor.

To continue this work, which we by no means consider new or original, we only need more money, as the law is quite sufficient.

The Indiana State Board has also directed its efforts towards preventing the spread of infectious and contagious disease by physicians. The first start in the matter was brought about by the Indianapolis Sanitary Association. A lady essayist asked—"If common people are subject to quarantine, after being exposed to the contagion of small-pox, scarlet fever and diphtheria, why not the doctors also?" "They go in and out of infected houses, and so far as may be observed, take no precautions against carrying disease. Indeed," said the writer, "I know that I myself suffered from puerperal fever because of a careless doctor, and the doctors themselves say this disease is carried by them from one place to another." This paper was given publicity and brought forth many accusations from people that their homes had suffered from infection borne by doctors. An instance was cited from Albion, Indiana, where a doctor infected his own and two other families with scarlet fever, and three children, two of them his own, gave up their lives on account of his carelessness.

After much discussion of the subject, and consultation with the Marion County Medical Society, rules were passed by the State Board of Health directing how physicians should proceed when visiting cases of infectious diseases. The said rules were received with ridicule by doctors on every hand, but the people believed them to be sensible, and so county newspapers everywhere upheld them.

In one county a physician who had almost certainly carried diphtheria to several houses, was driven from the community by the indignant people. This reform is believed to be confined to Indiana. It grows slowly but still it grows, and the time will come when physicians will take extra outward precautions when visiting diphtheria and scarlet fever cases.

Conference adjourned at 12 m.

Afternoon, Wednesday, August 10, 1898.

The members of the Conference, their ladies and guests, accepted a cordial invitation extended by Parke, Davis & Co. to partake of a luncheon which was served at their laboratories at 12:30 p. m. After luncheon ample opportunity was afforded to inspect the firm's biological and pharmaceutical laboratories.

This inspection was followed by a boat ride on the Detroit river and Lake St. Clair, this entertainment being provided by the local committee.

Wednesday Evening Session.

The Conference was called to order at 8:30 by the President.

A consideration of the work of the various State Boards of Health, which was interrupted by adjournment of the morning session, was taken up.

KANSAS STATE BOARD OF HEALTH.

DR. H. Z. GILL, TOPEKA, KAN.

Mr. President, Ladies and Gentlemen: There are some lines along which we have been trying to work more particularly than others, in the State of Kansas. Especially have we been giving attention to the public water supply of the various cities, believing that a pure, wholesome water supply in our cities will tend very greatly to diminish the amount of sickness, and especially of typhoid fever. We had occasion, less than a year ago, to make an investigation in the town of Manhattan, where the State Agricultural College is located. We had been receiving reports indirectly, not being able to get a proper report from the county health officer, that there had been a good deal of typhoid fever in that locality—a city or town of 3,000 inhabitants. Not being able to get a satisfactory report, and hearing indirectly that typhoid fever, or malarial or typho-malarial fever, was doing much damage and that there had been quite a number of deaths, we went there to investigate. We called upon the physicians, and we called upon the college authorities. The latter reported that none of their students had been sick with typhoid fever, or at least very few, if any at all. It was stated that the students were using the public water supply of the city. We learned that there had been a good deal of typhoid fever in the town, the college being about a mile and a half from the city. One physician who had formerly been on the State Board of Health stated that he had had no typhoid fever in his practice, but had had a few cases of what he called typho-malarial fever. Another physician had had sixty cases of typhoid fever on his books in September, October and November, perhaps running into December. His records gave the course of the disease, duration, general symptoms, and results. And it seems to me that any one at all acquainted with typhoid

fever would be ready to pronounce at once upon the nature of the cases. In a series of 54 cases from one physician, 19 of the cases were sick 30 days or more; 29 cases were sick 21 days or less than 30; 6 cases were sick less than 21 days making 54 cases in Dr. R.'s practice. There were 4 deaths and 50 recoveries, 17 cases were severe and 37 mild. We reported the results of our investigations and sent the report throughout the State to every physician in the State. About that time we received a report from the town in South Carolina where the State Agricultural College is located and where a similar state of affairs had existed. In their investigations at that place they endeavored to be very thorough and included Widal's test for the typhoid bacillus and for other bacteria. They found the plasmodium malaria in some of the malarial cases. Their investigations proved conclusively that the disease was typhoid fever. We first started to examine the public water supply, but we were unable to trace the source of the disease to it. Not a single case of typhoid fever occurred among people who used only the public water supply. None of the students were affected, with but one or two exceptions, and they boarded down town. Before that, in August, our Board issued a bulletin or circular letter on the subject of typhoid fever and its preventions, and sent it all over the State, giving the results of using pure and impure water. We cited the fact that in our neighboring city of Chicago the death rate from typhoid fever was ten times as great as that of Berlin, per thousand of inhabitants. We also advised that in all cases during latter part of summer and fall, where there was any doubt as to the wholesomeness of the water, to have it boiled before using. They had not done that at Manhattan generally, and they had not used, as a general thing, the public water; and the results were as I have just mentioned. Recently we have still further investigated the water supply of our large cities and we have had the chemist of our State University make chemical examinations of the water supply of the various cities. This is one line along which we have been working in preventive medicine.

Another is by municipal governments to inspect the dairies and the milk supply generally. I think we will soon have an ordinance in the City of Topeka by which this matter will be governed. I made a report about a month ago before the City Council, after visiting a number of dairies both inside and outside of the city. I discovered in these visits a state of things astonishing as well as disgusting, in many cases. I think if we can have the people informed—get them to thinking—bringing the facts before them, that in most of our cities there will be proper regulation of these matters.

In connection with the public water supply we have investigated the sewerage including that of the city of Manhattan (that city has no system of sewerage) and all sanitarians will understand why that clear, sparkling water contained disease germs. In the city of Topeka we had a report made of the location of all deaths from diphtheria, malarial fever, typhoid fever, and scarlet fever, in relation to the sewerage and water supply, and we found that there were ten times as many cases of malarial fever outside the sewerage and water supply as there were inside of it, in proportion to population.

We have also been trying to get some legislation by which we can enforce the sanitary and medical laws that are already in existence. It is useless to pass a rule or a law without a penalty for its infraction. The results will be nugatory—amount to nothing. If the people are not compelled to obey a law or comply with a rule they will not do so.

We get the material from which to make our statistics partly through medical channels and partly through the assessors. Right here I am reminded of one thing which should not be overlooked, and that is higher standards for admittance to the practice of medicine. The law by which we are now governed was passed a good many years ago and the qualifi-

cations consist, by that law, of two terms of lectures, and graduation from a respectable medical college, or a certificate of qualification from some State or county medical society. You can see the two latter are of very little force, because almost any county can organize a county society, and any person having a certificate from a county society would fill the requirements of that law. We want that law amended and I hope it soon will be.

Now there are some other things which we are trying to do in the way of preventive medicine and that is with reference to diphtheria. We propose to have such an arrangement that physicians may be able to know whether they are treating a case of true diphtheria or not. Diphtheria does not exist to any great extent in the State of Kansas, but still there are a good many deaths resulting every year from that disease, and we recognize diphtheria as a preventive disease. We have been trying to persuade the doctors to believe that antitoxin will do much when it is properly used, at the proper time, in a case of true diphtheria. I have been investigating that subject of diphtheria for the last twenty-five years. I believe the largest book ever written in English on this subject, so far as I know, at least (it numbers 625 octavo pages) bears my name on the title page, but when I published that work, 1887, we had not reached the bacillus diphtheria, and of course a new world has opened since then, and we are working along the new lines now. We desire especially to introduce bacteriological diagnosis that physicians may confirm their clinical diagnosis.

IOWA STATE BOARD OF HEALTH.

G. A. GUILBERT, DUBUQUE, IOWA.

The representatives of this body from the Iowa State Board of Health take pleasure in thus replying to the queries propounded in the official circular announcing the program of this thirteenth annual meeting.

First. "What are the principal lines of work of your body?"

Our reply is—Organization, Education, Action.

Second. "How is each accomplished?"

We answer, not seriatim, but generally. When about eighteen years ago our State Board of Health began its march to honorable fame, as the statutory ruler of the health interests of the Commonwealth of Iowa, it saw that in this, as in all humane or business endeavors, organization was the breath to the life of success. To that end it made it its especial mission to establish numerous rallying points for the inchoate sanitary forces of the State, from which schools of instruction adequate information, illustrated on occasion, by graphic object lessons, could promptly be disseminated widely and effectively. The misinformation which prevailed among the people, professional as well as lay, was very dense and they were pathetic as well. The vast majority knew little of the science and the art of hygiene, and for it cared less. They looked upon a State Health Board as one of the nineteenth century fads, as a sinecure title factory, which the legislative fool-killer should have promptly knocked out, instead of endowing it with force and power and constituting it a co-ordinate branch of the State government. As yet amateurs themselves, the members of the new Board were charged with the conduct of this endeavor, at a period when hygienic science was hardly out of its swaddling clothes, and methods of government were in the tentative stage. The medical members, who control, had been selected by the then Governor of the State, who was nothing if not a politician. The appointments, however, proved to be excellent ones. Two of the members were scholarly men, who had a taste for hygienic studies, and had had experience as college teachers. The other five were educated physicians of assured position. All were competent to "learn"

wisdom "by the things which they suffered," and the Lord knows that for years they suffered enough to, at last, have come to think of themselves "above that which is written" had they not have been level-headed men. Few published precedents were at hand, formula were fewer, and the literature of the science was not copious. The Board, besides, was confronted by an unsympathetic Legislature, which was cynically observing this new illustration of the art of "making bricks without straw," an art which God's chosen people found somewhat difficult of accomplishment in the aforetime, as we are informed. It is no wonder, then, that some years should have elapsed before Time, Faith and Energy—the three friends God has given to the pioneer of reform—had enabled the Board to indicate its right to live, had conquered an honorable peace, and had prepared a goodly heritage to leave to its successors for the behoof of the people. The writer has often thought that the makers of the Iowa Health Board methods, before they laid down their well worn "working tools," must have been fully in sympathy with that master of State-craft the historic Diocletian. He resigned the purple, it will be remembered, because he was oppugnant, at heart, to a persecution of the Christians which, against his better judgment, Galerius had induced him to decree. Regretting not the throne, to which he had given new luster, he gladly retired to his country place and devoted himself to horticulture, of which he was passionately fond. It is related by him that once he was asked, if, amid his then monotonous farm surroundings, he sometimes did not wish to resume the pomp and power of which he had, for years, been the central figure? Diocletian replied, "I have been a ruler of men and a planter of cabbages; of the two I am more content to plant cabbage." The founders of Iowa Health Board methods were men of affairs as well as prospective sanitarians. They knew, very well, that the unit of government in this nation was in the township organization. They recognized the potentiality of that unit. They deduced from such premises the inspirational idea that so likewise, the unit of effective State sanitary organization was in the township. They began the work early. They prosecuted it against odds, sternly and hopefully, but always diplomatically. Meanwhile, they gave due heed to the maxim *doce ut discas*, and they taught that they might learn. A few labor-filled years went by, and they had succeeded in organizing a Health Board in each township and city in Iowa, each one based on an adequate organic law enacted by the Board and common to all; each supreme, under the law, in its own sphere, yet loyally acknowledging allegiance to its creator State Board, its methods, its members, and its considerate decrees. By means of these prehensile tentacles, the present Board came into touch with the whole people. No organization could be more complete, or as effective. In every hamlet its influence is felt, and it is "a very present help in time of" epidemic "trouble;" when, for example, local disputes, concerning diagnosis or hygienic methods arise; or when a sudden pestilence with puzzling phases and mooted origin—like the famous Sabula epidemic, for instance—appears to play the deuce with sentimental medical ethics, and to terrorize communities. In quiet times the Board, like a good general, leaves its lieutenants in the towns and cities, wholly in control of their own affairs, under stringent law, holding them responsible for the results. When necessity calls to action, as it often does, such action is prompt and decisive. During the years of its adolescence, it was the policy of the Board that the campaigns of organization and education should march shoulder to shoulder. Accordingly, hortatory essays, leaflets, and circulars concerning the hygiene of dwelling and municipality, personal and general, followed each other in due succession, and the subordinate local Boards were charged with the duty of studying and disseminating them. And so the whole State resounded with hygienic clamor. Far-seeing editors, after a time, rose to the occasion and the

press became a somewhat efficient propagator of sanitary information. Gradually the question of Sanitary Science grew to be a paramount instead of a sentimental one in the medical societies and colleges of the Commonwealth, and there the cause achieved new distinction. At the end of six or eight years of this persistent work it became apparent to the public, that the founders, aforesaid, had "builded better than they knew;" that the mortality in preventible diseases had been largely reduced; that epidemics had decreased in frequency and virulence; were curtailed in their proportions and in their death rate; that the general death rate was annually being diminished, and that stability and permanence were the distinguishing features of the superstructure they had been depoted to erect. During all these years of organization, education and action, the Board has been fortunate in its secretaries, of whom, since 1880, there have been but three, to-wit, the untiring Andrews, the lamented Farquarson and since May, 1885, the genial and accomplished Kennedy. In the year 1887 a new and effective helper appeared in the form of that long well-known sanitary monthly, "The Iowa Health Bulletin." Six thousand copies of the journal are issued and distributed every month, "without money and without price." They are mailed to all the local boards, to interested physicians, and laymen. Many copies of the paper, full of information, entertainingly put, find readers in other States. They have popularized the name of Secretary Kennedy, who has been its editor since it was born. Its literary excellence, is conceded and is all the more varied, because its editorial writers are not expected to say Shibboleth exactly alike. The exceptionally thorough organization of the State, the wide diffusion of hygienic information and the general satisfactory condition of Health Board affairs in Iowa, are present sources of pride to all who have been active laborers in this particular vineyard. Yet we are surprised, when we review the past, at the magnitude of present results, which have been achieved in spite of meager monetary resources.

Unlike some other Commonwealths; notable unlike the one, the quarter-centennial of whose noble Board of Health we have just assisted in commemorating, our State has not been generous to its Health Board. A large minority of our State Legislature has always been with us, under the lead of a goodly number of medical men, biennially found there as valuable members. That minority has invariably been attent to our frank contention, that income and "the vocation wherewith we are called" could with benefit to the cause be made more nearly conformable. But, too often, the majority has been unpropitious, and so we have done what we could, patiently biding our time.

Prominent among the instances of the fealty of our State Board to its doctrine of organization, education and action, we may mention two which have now national significance. Early in the present decade, the Board was almost the first, if not the very first, to see that the question of the transportation of corpses, especially of the dead from infectious diseases, was one of vast and immediate importance. Prompt consideration was given the question and its various phases. Intelligent railway managers, and educated funeral directors were consulted. After a few months incubation rules were adopted, which were at once put in force by railroad managers in Iowa. These regulations proved to be so timely and good, that they became a nucleus of more elaborate regulations which this Conference received from the notable Cleveland Convention of June 9, 1897, and favorably considered at Nashville last year, recommending them for adoption to their principals, the various State Boards. They were duly examined by our State Board and cordially adopted. In the absence of appropriate legislation, which we failed to secure, the Board, acting under the ruling of the astute Attorney-General of Iowa, Hon. Milton Remley, exercised its lawful police powers, and brought organization and action into at-one-ment on this

contention, at the annual meeting in May last. The office of Licensed Embalmer was created. Proper regulations concerning the office, its duties and its limitations were enacted. These were heartily approved by the representatives of the State Funeral Directors' Association, at the head of which was the distinguished Hohenschuh. Under these rules some sixty-four applicants for the embalmer's license, of whom sixty passed, submitted themselves to a very rigid written examination, at our headquarters in Des Moines July 26th, and the movement is on.

The other is that concerning tuberculosis, human and bovine. For several years past this comprehensive subject has had serious consideration of the Board. Due investigation and study, along both lines have duly been employed. Frequent reports on different phases of the subject have been given and conclusions have been reached, which are not unlike those reached by observers in other States, and which will be discussed at this meeting of the Conference. The public of Iowa, has as usual been kept apprised of our actions in this direction, by customary circulars of information, and a more elaborate summing of the question is now about to be put on the press, and will, when issued, be generally disseminated.

Another thing we ought to mention: From its inception, the policy of the Board, within the circle of its influence, has been in the direction of the elimination of the idea, that in sanitary matters, at least, the broadest tolerance should not be cultivated, and that no one school in medicine should be preferred to another. The Board—as a Health Board—cares nothing for Pathies, as Pathies. In its opinion, sanitary science is wholly sectless. It holds that "a man's a man for a' that." It realizes the force and aptness of Paul the Apostle's axiom, which is the golden text of the gospel of toleration and unity, "There are, it may be, so many kinds of voices in the world, and none of them is without significance."

It never engages in, neither does it countenance, within the lines of its duty, profitless discussions of medical creed titles, which always end where they began. Life is too short and too real for sensible men, nowadays, to waste brain gray matter on such tom-foolery. Besides, we hold in reverence the wholesome doctrine, *noblesse oblige*, and to it conform. This total effacement of sectarian lines in non-partisan Boards, like our own, has been an educational object lesson to the profession at large and has done very much to lessen spoken and printed asperities in States where nonpartisan Boards exist under enlightened legislation. So, it is less frequent now than it was fifteen years ago, to see controversial medical asses, who certainly were boors instead of gentlemen before they were born by the breech into the profession; cavorting around with defiant chips on their shoulders; "biting their thumbs" at those with whom they differ and bravely flinging stink-pots at all and singular who decline, at their bidding, to look at facts and things and brother men through the reversed end of the telescope. In concluding: We are instructed to assure our conferees of the State and Provincial Boards here assembled, that Iowa yields to none in her desire that the *entente cordiale*, which has long subsisted between it and its honored sisters may long continue. She recognizes in them valuable helpers and experienced teachers, whose labors on behalf of the race she applauds and has sought to emulate, for they have been abundant and far-reaching and valuable beyond computation. In the give and take of friendly offices, and in the chivalrous rivalry "to see who best can work and best agree," Iowa has been no laggard. She is not built that way. To this conference of sister State Boards of Health, so long as it holds itself aloof from entangling alliances and remains *sui generis*, we shall come annually with our fraternal representatives, bearing the gifts of confidence and good will and honorable rivalry; asking nothing in return except a pledge that this body shall remain true to the traditions

under which it was formed and "hold the faith in the unity of spirit;" that faith which is outlined in the axiom, which should be, but unfortunately is not, obeyed by all associations—"in certain things Unity; in doubtful things, Liberty; in all things, Charity."

THE PURIFICATION OF SURFACE WATER.

BY GARDNER S. WILLIAMS, DETROIT.

The impurities in surface waters may be classed under five heads:

First—Mineral waters in suspension or solution.

Second—Dead organic matter—in suspension.

Third—The larger aquatic plants and animals.

Fourth—The microscopic organisms indigenous to the water.

Fifth—The foreign bacteria including the disease germs.

The processes applied for the purification of waters are straining, aeration, sedimentation, filtration, boiling and distillation, besides chemical treatment which is ordinarily applied in connection with one of the other methods, and each has its counterpart in the preparations through which the waters that are furnished for the use of man are passed in nature's vast laboratory.

It is only within a comparatively recent period that this subject has received a much merited attention in America, or even abroad, and to-day there remain many erroneous ideas concerning its necessities and its possibilities.

There are probably before me now those who repose faith in the ancient dictum that running water purifies itself, the amount of running necessary depending upon the distance of their particular water works intake from the nearest source of pollution. In the light of recent investigations no more misleading doctrine in connection with water supply was ever foisted upon an innocent and unsuspecting public, unless it be that chemical analysis alone is sufficient to determine the wholesomeness of a water to be used for domestic purposes. These twin heresies, bred of the same original error, are so intimately connected that I will briefly consider them together. The impurities found in flowing water comprises certain inorganic or mineral substances in suspension, usually harmless, and more or less decayed organic matter of both animal and vegetable origin, partly in suspension and partly in solution, in itself not dangerous, together with microscopic living organisms both animal and vegetable, and lastly bacteria, organisms so small that with the most powerful microscopes we can barely distinguish them. As an example, the typhoid bacillus magnified 1,100 times is not so large in body as our common house fly. The inorganic matter is made up of potash, soda, lime, magnesia, iron and alumnia in combination with chlorine and carbonic, sulphuric and silicic acids. The organic matters are composed of carbon, nitrogen, oxygen and hydrogen, animal matters containing more nitrogen and less carbon than vegetable matters.

The process of decomposition in the organic matter takes place as follows: The carbon is first oxydized by the oxygen from the air mingled with the water, the resulting compounds being ammonia and carbon dioxide, next the ammonia is oxidized to nitrous acid and this is again oxidized to nitric acid, which combining with the mineral constituents, forms a nitrate and ends the process. So far as the conditions of this process are concerned the chemical analysis tells us with fair accuracy in what stage the matter in the water may be, but it fails entirely to indicate the presence of those minute living organisms which constitute the real source of danger in drinking waters.

The results of a chemical analysis as usually given show 1, the quantity of chlorine; 2, the amount of so-called free ammonia; 3, the amount of albuminoid ammonia; 4, the amount of nitrites; 5, the amount of nitrates; 6, the amount of fixed residue remaining after heating to a dull red with sodium carbonate; 7, the loss by so heating, and 8, the amount of oxygen consumed when the sample is boiled for a fixed length of time with permanganate of potash.

The chlorine, in itself harmless, if in excess of the normal quantity in waters of the particular locality, indicates previous sewage pollution.

The free ammonia which, however, is almost never free as the hydrate but is ordinarily the chloride or carbamate, and the nitrates, harmless in themselves, indicate organic matter in a state of partial decomposition. As free ammonia is a prominent constituent of sewage, it has been claimed that this is an evidence of sewage pollution, but high free ammonia is often found in waters in which there is no possibility of sewage pollution, so we must only say that it indicates partially decomposed organic matter.*

The albuminoid ammonia measures the amount of undecomposed organic matter, or more exactly the amount of nitrogen in it.

The nitrates indicate completed decomposition, and are harmless in the quantities usually occurring.

The fixed residue measures the mineral constituents and the loss on ignition is an indication of the volatile constituents.

The quantity of oxygen consumed bears some relation to the amount of carbon present, but different substances behave very differently with the permanganate of potash, and hence this factor is only useful in comparing similar waters and has no significance with waters of dissimilar origin and nature.†

So far as micro-organisms are concerned they are only indicated in the chemical analysis by a slight increase in the albuminoid ammonia which can in no way be separated from that due to partially decayed or dead matter. One of the best evidences of this is given by Prof. Frankland (*Micro-organisms in Water* p. 101-102), in an account of an examination of the River Dee in Scotland, which supplies Aberdeen with its water. The examination covered forty miles of river and beginning at the source the number of bacteria per cubic centimeter was first only 88, at the next point of observation they had increased to 2,829, at the next they had decreased to 1,139, then they increased again to 3,780, decreased to 938, increased to 1,860 and finally decreased to 950, and yet through all these changes in which the increases were uniformly caused by added sewage, Frankland says: "It was found impossible by means of chemical analysis to detect any material alteration in the composition of the river, even immediately below each of the above sources of contamination."

The fact that chemical analysis does not indicate changes in the bacterial compositions of either sewage or water is shown by the following examples of analyses, taken at random from the report of the Massachusetts State Board of Health for 1891, and covering a wide range of conditions.

* Rep. Mass. S. B. H. Water Supplies 1887-1890, p. 550; Rep. Mass. S. B. H. 1892, p. 319 *et seq.*

† Rep. Mass. S. B. H. 1892, p. 328.

PARTS PER 100,000.

	Free Ammonia.	Albuminoid Ammonia.			Chlorine.	Nitrogen as		Oxygen Consumed.	Bacteria Per C. C.	
		Total.	Soluble	Insoluble.		Nitrates	Nitrites			
Lawrence Sewage. Average of daily Analysis for										
1888	1.5528	.6878	.1161	.5267	5.19	0	0	.....	1,000,000
1889	1.8439	.5540	.2909	.2631	4.92	0	0	.....	708,000
1890	1.8200	.6862	.3805	.3057	5.45	0	0	3.25	1,085,000	
1891	2.2196	.7295	.3446	.3849	7.37	0	0	3.64	693,000	
Analysis of										
July 3, 1890	2.50	.65	.51	.14	4.87	—	—	2.90	7,560,000	
" 7, "	2.10	.81	.57	.24	7.07	—	—	3.30	807,000	
" 14, "	2.75	.88	.88	.00	5.97	—	—	3.00	159,060	
" 17, "	2.75	1.05	.55	.50	6.10	—	—	2.80	1,401,000	
Effluents of Sewage Filters. Analysis of										
Oct. 2, 1891	.0242	.0144	—	—	10.46	3.06	.0018	.15	3,600	
" 9, "	.0132	.0128	—	—	8.16	3.20	.0014	.14	50	
" 16, "	.0012	.0144	—	—	8.02	1.67	.0080	.16	19,440	
" 23, "	.0070	.0104	—	—	6.86	1.85	.0004	.18	188	
" 30, "	.0102	.0096	—	—	7.10	1.66	.0012	.10	280	
May 8, 1890	9:15 a. m.	.8000	.0500	—	—	4.39	2.75	.0200	.12	1,836
" 11:08 "	"	.8200	.0800	—	—	4.39	3.00	.0140	.13	1,404
" 2:42 p. m.	"	.8000	.0800	—	—	4.34	2.75	.0120	.14	6,318
" 5:24 "	"	.8500	.0500	—	—	4.36	3.00	.0180	.11	12,204
" 8:45 "	"	.8500	.0500	—	—	4.39	2.75	.0220	.12	1,026
Lawrence City Water. Analysis of										
Dec. 9, 1891	.0028	.0138	—	—	.25	.0260	.0002	.40	38	
" 16, "	.0034	.0148	—	—	.21	.0330	.0002	.41	330	
" 23, "	.0030	.0136	—	—	.24	.0320	.0002	.39	1,320	
" 30, "	.0030	.0120	—	—	.22	.0200	.0001	.37	156	

Prof. Drown discussing this subject, says: (Rep. Mass. S. B. H. Water Supply, etc., 1887-1890, p. 536.) "Students of sanitary science have attempted to establish certain standards of purity of water based on the determination of nitrogen. These standards express limits for organic nitrogen, or albuminoid ammonia, free ammonia, nitrites and nitrates, beyond which the water containing them should not be used for drinking. Some of them have the sanction of sanitary congresses, and some are merely the expression of individual opinion. The application of these standards of purity has condemned many waters which were certainly unfit to drink, but it is equally certain that many wholesome waters have been thereby rejected. The following table, another part of the same report (p. 541), brings out this point:

PARTS PER 100,000.	Color.	Residue on Evap. Total.	Loss Ig. Fixed.	Ammonia. Free. Alb'm'd.	Chlorine.	Nitrogen as Nitrates. Nitrites
Unpolluted Waters. No. 1	0.00	5.00	0.70	4.30	.0000	.0022
2	0.10	2.50	0.95	1.55	.0000	.0702
3	0.60	5.15	3.25	1.90	.0000	.1252
4	0.40	8.65	1.65	2.00	.0130	.0333
5	0.30	3.25	0.95	2.30	.0000	.0136
6	0.00	5.95	0.80	5.15	.0000	.0152
Polluted Waters. 7	0.10	10.75	2.05	8.70	.0124	.0284
8	0.55	5.15	1.95	3.20	.0000	.0196
9	0.10	5.00	0.85	4.15	.0016	.0198
10	0.15	10.25	1.20	9.05	.0000	.0262
11	0.15	12.70	2.10	10.60	.0664	.0263

"The fallacy of making 'standards of purity,'" continues Prof. Drown, "based upon the organic nitrogen, ammonia, nitrites and nitrates, is apparent when we consider that these substances are not

injurious in themselves, at least to the extent which they are found in natural waters, and that the presence of any one of these substances in water does not in itself necessarily carry with it any indication of its origin. These standards are relics of the days in which the harmfulness of a water was supposed to be the direct result of the injurious action of specific substances found in it. The theory of to-day is that it is (in the large majority of cases) to the presence of micro-organisms in water that its harmful influence is due."

Thus the chemical analysis is seen to be often insufficient to determine previous sewage pollution in water, and in the case of surface water it is often superfluous. As has been very pertinently remarked, "It does not need a chemical examination to decide whether a stream is polluted or not when one can see the sewage flowing into it."

In determining the quality of a water supply every source of information bearing upon it should be investigated. The engineer should be called upon to ascertain all possible or probable sources of pollution, and the source of the water itself. This information should be given to the chemist who should then make his examination. The idea often prevalent in some communities that the way to get a fair result from an analysis is to keep the chemist in entire ignorance of the source of the water and everything about it, is most erroneous. While chemistry is an exact science and there is not likely to be much doubt as to the constituents found, the interpretation of results depends for its correctness on all the facts concerning the water being properly considered. Next the microscopist should be called upon to determine the organisms, vegetable and animal, that are recognizable with his instruments. These organisms may not be positively harmful but frequently give to the water disagreeable tastes and odors, so that their presence is not to be desired. Finally the services of the biologist should be invoked to determine the number and kind of bacteria in it, as from them oftentimes, though it may be impossible to find the specific germ of any disease, it is possible to establish the probability of such specific germs being present.

The chief, if not the only source of disease germs in water is animal sewage, and the number of bacteria in water, of all kinds, harmless as well as dangerous, may range from none to several thousand per cubic centimeter. The number in sewage being often more than a million.

The number per gram (about one-thirtieth of an ounce Troy) in the feces of a healthy man ranges from as low as 10,000,000 to 200,000,000, while those of typhoid fever patients contain as high as 1,000,000,000. "If we assume that a man discharges about seven ounces of feces daily, this would give for typhoid patients 200,000,000 bacteria discharged daily per person" (Filtration of Public Water Supplies, p. 133). The number of bacteria found in sewage is usually higher, often double this number per person. Not all, fortunately, of these bacteria are dangerous, perhaps ordinarily not more than one in two or three thousand, but the feces of typhoid patients contain the germs of that disease, and although in water there is no evidence that they, or any other disease-germs increase, they retain their vitality for varying periods, and if granted favorable conditions will at once develop colonies of fellows. It is the possible presence of these latter organisms that renders chemical analysis fruitless for the purpose it has been so long considered final.

The so-called self-purification of rivers takes place to varying extents in three ways. By dilution, by sedimentation, and by oxidation and light.

The first means is by far the most important. The inflow of pure or unpolluted water below the point of contamination reduces the percentage of dangerous organisms in the stream. This inflow of purer water comes not only from visible tributaries, but from subterranean streams flowing into the river at all points, so that while there may be

no visible tributaries an immense increase may take place in the flow of the stream.

The second means of purification, subsidence, is due to the fact that the mineral matters and about half of the organic matter are merely in suspension and if the current be not too swift, these will settle by gravity to the bottom and may carry with them a considerable number of bacteria. On this account partially more bacteria are found in the lower than in the upper layers of a body of water. So a stream that has flowed through a lake or pond or reservoir, may be expected to contain a smaller number of bacteria than it did before entering the same.

The effect of oxidation, supposedly promoted by aeration in the passage over falls and through rapids, is greatly overestimated. Examinations of Niagara river water above and below the falls showed practically the same bacterial composition. The experiments of the Massachusetts Board of Health (Report for 1892, p. 320,) prove that oxidation of the organic matter from ammonia to nitrates occurs only in the presence and by the aid of certain bacteria, but the completion of the process is no evidence of the termination of life of any of these or other organisms. Moreover, the time required for oxidation of these organic matters in solution differs widely under different circumstances and the vegetable growths in the channel frequently mask the action of the process by appropriating its products at various stages (Mass. S. B. H. Rep. 1890, Pt. I, p. 575). Besides all this, the period of life of some bacteria has been studied, and among them, that of the typhoid bacillus has been found to be from fifteen to thirty days in Merrimac river water, and somewhat longer in the purer effluents of filters.

In distilled water these germs have been found alive 150 days after inoculation and in Lake Michigan water at Chicago they have lived 90 days, in Thames river water at London 75 days and in Ohio river water at Cincinnati 60 days, and these bacteria do not appear to be affected by oxidation, and some European experiments show that they are not affected by sunlight at depth of nine feet in water. (Mass. S. B. H. Rep., 1892, p. 528.) (Micro-organisms in Water, p. 372.) How far would these bacilli travel in an ordinary river during a life time of fifteen days? I venture to say considerably more than the distance allowed for water to purify itself. Indeed we have the best of evidence that after traveling thirty-nine miles from Lowell down the Merrimac river through almost stagnant mill ponds and over dams and through rapids, the last fourteen miles of the journey being affected by tide water, they still had sufficient vitality to pass through pumps and water pipes and produce an epidemic of typhoid at Newburyport, in January, 1893 (Mass. S. B. H. Rep. 1892, p. 701), and the repeated epidemics of typhoid at Lawrence following those at Lowell nine miles up the river, give conclusive evidence of their vitality through similar vicissitudes for the shorter distance, although the water was stored for more than a week in the Lawrence reservoir, while some of the epidemics at Lowell appear to have been caused by the disease as far away as Concord, N. H., forty-eight miles up the river. Nor is an epidemic necessary to produce these results. Four cases of typhoid three miles above the intake of the Lowell water works in 1890 caused an epidemic in that city involving 550 cases and resulting in 92 deaths, which was immediately followed by one almost as severe in Lawrence (Rep. Mass. S. B. H., 1892, p. 668 et seq). The Plymouth, Penn., epidemic, 1884, involving over 1,000 cases and over 100 deaths was caused by the contamination of a water supply by a single patient. But it is not necessary to go to Massachusetts or Pennsylvania for evidence of the vitality of pathogenic bacteria. There is the strongest evidence that the excessive typhoid fever in this city in 1892 resulting in more than 200 deaths during that year while in 1890 there were only 39 and in 1897 only 31, was transmitted directly from Port Huron through the water supply.

The principal methods in use for the purification of water are sedimentation, bleaching, chemical precipitation, filtration and distillation. The first is accomplished by bringing the water to rest for a comparatively limited time in shallow basins when the suspended matters fall to the bottom and the clarified liquid is drawn off from above. Bleaching is accomplished by storing the water for long periods in deep reservoirs by which means the color and many other disagreeable properties are removed and any dangerous bacteria are left to die a natural death. Chemical precipitation is accomplished by treating the water in tanks with chemicals which cause a deposit of both suspended and dissolved matters. But by far the most important method of purification is filtration, though distillation is perhaps a more ideal method, but one which for economic reasons we are precluded from utilizing.

The necessities of filtration are not nearly so well appreciated in America as in Europe. In Germany the law requires that every surface water used for a public supply shall be filtered, and minute regulations are enforced regarding the operation of each filter, including among other requirements a daily bacterial analysis of the effluents by a person of assured capability to conduct the investigations. In England, filtration of surface waters, though not universal, is extensive, and is almost universal in Belgium and Holland and quite common in France.

In Great Britain for instance, the city of Liverpool has gone sixty-eight miles into the Welsh mountains to Lake Vyrurry, and secured a supply of water far purer than that supplied to any large American city, and after all this care in selecting a source and every precaution against pollution in conveying the water to the cities, the entire supply is filtered before delivery to the consumers. The result is apparent in the typhoid death rates of that city which are below 2 per 10,000 while the average of 19 American cities is 4 2-3 per 10,000. What Liverpool has done Manchester has also already and Birmingham is preparing to do in the near future.

The filtration of water is now being accomplished by two processes. The natural or slow-sand method being the older and more reliable, while the mechanical, aided by coagulents is a newer and as yet less perfect system, although for certain waters the latter possesses some advantages. The first sand filter was constructed at London in 1839 by Mr. James Simpson, engineer for the Chelsea Water Co. "This consisted essentially of a shallow reservoir with a collecting drain through the center and with lateral drains of porous tiles or bricks without mortar leading into the central drain. On top of this system of drains were laid from three to four feet of gravel and sand decreasing in fineness to the top. Through this sand bed water was allowed to percolate slowly into the collecting drains, whence it was led off to the wells for distribution." So successful was this device in removing sediment and improving the appearance of the water that in 1852 its use was made compulsory with all companies supplying London with surface water, and the filter was rapidly adopted elsewhere, both in England and on the continent. The earliest attention given to the subject in America, appears to have been in 1866, when the St. Louis Water Board, then having under consideration the construction of new works, sent their engineer, Mr. James P. Kirkwood, to Europe to investigate and report on the subject of filtration. Though his recommendations regarding the St. Louis works, after being endorsed by the Water Board were rejected by the City Council, the report was published in 1869 and is even to-day considered almost a classic on the subject. So complete was it in description and so clear and ample in its suggestions and deductions that notwithstanding the improvements and developments of the process, it has remained until within a year the only treatise on filtration in the English language. At the time of his visit he found filtration plants in operation in Berlin, Altona, Nantes and Marseilles on the continent, and in Leicester, York, Liverpool, Edinburgh and Dublin as well as in London.

As a result of these investigations sand filters were constructed at Poughkeepsie, N. Y., in 1872; at Hudson, N. Y., in 1873, and at St. Johnsbury, Vt., in 1875, which have continued in service to the present time, but until 1893 no other places took up the matter. Since that time, however, the area of filter beds in use in the United States and Canada has increased from less than one and one-half acres to nine and one-quarter acres, and seven and three-quarters acres are now under construction, the largest being at Albany, N. Y.

The work of a sand filter is not, as many suppose, merely a straining but is accompanied by chemical and bacterial changes in the water.

As soon as a sand filter is placed in service there begins to form upon the surface what is termed the "mat" composed of masses of bacteria which prey upon one another and those of the passing water as do also those which are found in the deeper layers of the sand. Until the "mat" is formed the effluent or filtrate from a new filter will not be properly purified so that it must be wasted for the first few days and it may take several weeks for the filter to reach its proper efficiency. This fact has led to the belief, very prevalent in Europe, that the "mat" was the one essential and that only so much sand was required as would support the "mat." This, however, proves to be a mistaken notion and bacterial and other changes are found to be taking place at the different depths of the filtering material.

The action of the various layers of the filter in removing organic matter and bacteria is shown by the following analysis of sand at various depths from a continuous filter passing Merrimac river water at a rate of 5,000,000 gallons per acre daily. (Report of Mass. State Board of Health, 1894, p. 603).

Depth from Surface.	Organic Nitrogen. (Parts Per 100,000 Per Weight of Dry Sand.)	Bacteria per Gram.
0½ inch.	21.8	5,460,000
1 "	13.3	1,500,000
3 "	6.9	820,000
6 "	4.1	245,000
12 "	4.1	120,000
24 "	1.8	49,000
36 "	1.0	42,000
48 "	0.6	35,000
60 "	1.3	13,500

In practice the filter supplying the City of Lawrence, Mass., has for a year removed an average of 99.3 per cent. of all the bacteria in the applied or raw water, and the albuminoid ammonia has been reduced 50 per cent.

With the increasing demand for purer water many patents were taken out for filters embodying first a chemical precipitation more or less complete of the foreign matters in the waters, and, second, a rapid straining through sand. Several large plants have been installed of this type, the largest being at Atlanta. When properly handled these filters give very satisfactory results under certain conditions, but a decrease in the supply of coagulent for as short a period as fifteen minutes is apparent in the bacterial quality of the effluent. Contrary to expectation it has been found that with highly turbid waters the precipitation of the mineral constituents does carry down perceptible numbers of bacteria, but that a second treatment is necessary for their removal, and this appears to be one of the secrets of the lack of success of the mechanical filter plants when they have been subjected to thorough tests with sediment-bearing waters.

From the experiments to date it seems that slow sand filtration is as yet the only thoroughly reliable method of water purification on a large scale.

Dr. Lee: "The members of the Conference have listened to this very interesting paper, and the question now arises as to what shall be done with it. As Mr. Williams is not a member of the Conference, it will require a motion for it to have a place in the proceedings."

Dr. Henry B. Baker, Michigan: "I move that a vote of thanks be extended to Mr. Williams for his very interesting paper, and that it be referred for publication."

Seconded and carried.

Immediately following the above address, Dr. Hurty, of Indiana, exhibited lantern pictures of various sand filter beds in the United States and in Europe. Pictures also of various mechanical filters were given. The pictures were fully explained.

Dr. James Evans, Florence, S. C.: "The statement made by Dr. Hurty, of Indiana, that usually it was not necessary to make bacteriological examination of water supplies when the chemical analysis showed the requisite degree of purity, cannot be accepted without qualification. Chemical analysis may show only the presence of organic matter not more than is contained in the purest mountain water; it does not, however, reveal the fact whether it is derived from harmless vegetable matter or from pathogenic germs, and that can only be determined by bacteriological examination. It would be safer to say that a chemical analysis of a potable water is hardly ever necessary when bacteriological examination of it shows it does not contain germs capable of communicating disease.

"During May and June of 1897 eighty-five cases of fever occurred at the Clemson Agricultural and Mechanical College in South Carolina, which resulted in the premature closing of the exercises of the institution and sending the pupils to their homes. As there was some doubt entertained by the board of trustees as to the nature of the disease, and in order, likewise, to ascertain the source of the infection, a committee of the State Board of Health were requested to visit and examine the buildings and grounds and water supply of the institution. Many circumstances pointed unerringly to the spring supplying the dairy as the chief, if not the sole, focus of infection, although the water from this spring had several times been analyzed by the professor of chemistry in the college and pronounced exceptionally pure. In this spring, however, the bacteriologist of the State Board detected, isolated and cultivated the bacteria known as *bacillus typhi abdominalis* and *bacillus coli communis*. This college is beautifully situated on gracefully undulating hills at the foot of the Blue Ridge."

Dr. James Fulton, Baltimore, Md.: "I think we have had the pleasure of listening to a very interesting paper, and I not only commend the judgment of Mr. Williams, but I admire his courage in attacking the water supply of his own city in the presence of sanitarians from all over the country—laundering his soiled linen publicly, as it were. The subject was exceedingly well handled. In the city of Baltimore we have about the same typhoid rate as you have in Detroit—about 4.5 to 4.8 per 1,000 yearly. As long as the mortality remains at that figure you can't persuade Councils to do anything. If the typhoid bacillus could speak in a voice of thunder, or be known as the cause of an earthquake, or come in a great epidemic, that would remedy the evil at once. A great epidemic is a great sanitary reformer, and such a reformer would stimulate even the Council of Detroit to action. So far as analyses are concerned, I consider the value of the chemical and the bacteriological as comparable—about equal. A study of the water supply must necessarily include all the things which can throw light upon the subject. How long the typhoid bacillus can live is a mooted question. Very little is known about that organism. We do know that it can live under diverse conditions. It will live in ice; it is a very resistent organism to drying; it lives in the ground quite tolerably—not an active existence, but a dormant one; in streams it can live quite a time, especially if protected by an envelope of feces. It must be remembered that the typhoid germ can go through the bodies of lower animals and multiply with no apparent effect upon the animal, and be discharged with the feces and resist the action of rapid-flowing streams for a long time. In the same manner it escapes from 'walking typhoid' cases. Such bacteria would hardly be broken up if in the water which pours over Niagara. And then again, dilution has been favorably spoken of. We must remember that with dilution the organism increases in virulence up to a considerable degree, and in this it is far different from a chemical solution. You may not have as many bacilli in a drop of water, but the few you do have are dangerous. Our present knowledge of bacteriology has its limitations. There are other organisms of which we know little, and which we cannot cultivate—the protozoa, which are pathogenic. The plasmodium of malaria has not been cultivated outside the body. I think, in determining the wholesomeness of the water supply, that advantage should be taken of everything that will throw light upon the subject. If Dr. Williams will come down to Baltimore and read his paper, I will guarantee him the services of a sufficient number of men to get him out of town safe."

Dr. C. O. Probst, Columbus, O.: "If I understood Mr. Williams correctly, there is one point in this very able paper to which I must refer, and with which I take issue, viz., that there is no real purification by sedimentation. If I understood him correctly, he inferred that there was no bacteriological purification by sedimentation. Many of our cities now use storage reservoirs, and I believe that investigations will show that there is a very considerable amount of bacteriological purification resulting from the sedimentation.

"Mr. George Fuller, who conducted experiments at Louisville, is now carrying on experiments at Cincinnati with the view of enabling that city to determine the best method of purifying its water supply. His experiments have extended over a period of three or four months. He has about fifteen experimental filters and a number of settling tanks. I had the pleasure recently of looking over the work. His results have been very satisfactory. By seventy-two hours' sedimentation of Ohio river water, about 90 per cent. of the bacteria are removed. I think Dr. Johnson reported to us at the Montreal meeting a very considerable purification of the water supply of that city, obtained by the simple storage of water; and it has been shown in a number of places that the storing up of water will result in a very beneficial change.

"In regard to the mechanical filtration of water supplies, it is entirely possible to get very excellent results, if we use a sufficient amount of coagulant, but we have had an experience in our State which shows that a proper amount of coagulant may not be used if the water presents a good appearance. An attendant engineer at one of the mechanical filter plants told me that he did not pretend to use the coagulant if the water was clear and presented a good appearance. In another town, where they have a mechanical filtering plant with a capacity of 2,500,000 gallons of water daily, it is necessary to use at least $2\frac{1}{2}$ grains to the gallon of water to purify it, and at that rate the cost for alum would be greater than the fuel cost, or over \$5,000 per year. You can see, in looking at the matter from this standpoint, that there will be a tendency on the part of the public officials to economize in the matter of alum when the water looks well."

Dr. Gardner T. Swarts, Rhode Island: "I do not like to see this subject discussed in only one direction, and in order to bring out a fuller discussion I will say that, as Dr. Probst has intimated, mechanical filtration will purify water. It will remove as many bacteria as the sand-bed filter. The efficiency of the

bacteriological work of the filters being equal, of course there are many other things to take into consideration. So far as the attendants upon a mechanical plant not using sufficient alum is concerned, I do not think there would be any danger from that source in a properly governed municipality. But so far as filtering efficiency is concerned, the filtering area of a sand-bed could also be reduced by economy of attendants, just as much as the mechanical filters. The sand-bed might not be cleaned as often as it should be on account of the expense. It is not to be expected that an engineer will run a boiler above its pressure guarantee, and it certainly should be expected that a municipality and its employes will properly run a filter according to direction, whether it be a sand-bed or a mechanical filter. So far as past experience goes, it is shown that the first cost of the sand-bed is greater than that of the mechanical filter, and it is more expensive in its manipulation. Take the Lawrenceville filter, for instance; its cost of maintenance is constantly increasing and the value of the beds constantly decreasing. It has been said that it would require the attendance of skilled engineers to run a mechanical filter; I say that any person with fifteen minutes' instruction upon the valves and connections could run a mechanical filter; but to instruct a man so that he could scrape off the one-fourth to one-half of an inch of sand, evenly, from the surface of a sand filter would take time, and it would take time to acquire the skill to do it. In other words, it requires skilled labor to remove a thin layer of sand, and it does not require skilled labor to turn a valve. I think all of these things should be taken into consideration in the adoption of a filter. It has been stated that the mechanical filter is in the experimental stage. It must be remembered that a long series of experiments were continued for months in Louisville, and the efficiency of the mechanical filter and its perfect mechanism and operation were shown.

"The operation of the sand filter is dependent upon the elements, and there is need for the expensive coverings which were shown on the screen by Dr. Hurty, and this is a fact which must be considered in our Northern climate.

"Another point of difference is this: In the sand-bed system the average is only about two million gallons per acre per twenty-four hours. You can filter one hundred to one hundred and twenty-five million gallons by the mechanical filter in the same time.

"Now, as regards cleaning. It requires from two to three days to clean a sand-bed. The length of time necessary to clean a mechanical filter is from twenty to thirty minutes.

"All of these matters should receive careful consideration. Economy of time is an important factor. The area required in proximity to a city and the pumping station are things which must be considered by the engineer.

"So far as natural sedimentation is concerned as a means of purifying water, it is well known that it is absolutely impossible to precipitate by sedimentation many of the waters flowing in our Western rivers. There is a fine flocculent mineral matter which will never settle, and the filtering of this kind of water through a sand-bed soon results in clogging the filter and reducing the efficiency to a minimum, while finer particles will in some waters pass through the interstices of the sand-bed, leaving a cloudy, milky water. By the use of a coagulent these waters can be easily filtered.

"I say all of these points should receive careful consideration, that we may be able to advise our constituents when our opinion is asked, as it surely will be. No two waters are alike. What is true of Detroit water is not true of the water of Eastern brooks, rivers and lakes, nor of the water of the Western rivers. In other words, one-half grain of alum per gallon in the East is sufficient, but in some Western waters it may require from four to five. In 1894 the city of Providence spent several thousand dollars in investigating this matter and in experimental filtration, and it had just about concluded to close a contract for the fifteen million gallon per day mechanical filter when threatened litigations on the patents precluded the possibility.

"So far as cost is concerned, the mechanical filter being a positive mechanical device, it is possible to accurately estimate its cost, but this is not true of a sand-bed filter. This is shown by experiments in Albany, where a sand filter is being constructed. The work is only partly under way, and yet I am informed that it has already cost within a few thousand dollars of the original estimate.

"I hope, gentlemen, this subject will be freely discussed, because it is a question in which every health officer is interested, and upon which his judgment will be demanded sooner or later, and he will have to give substantial reasons for his preferences, for his likes and dislikes."

Dr. P. H. Bryce, Ontario: "The subject, it seems to me, divides itself into two parts—the one with regard to dangers of polluted water, and second, that with regard to the methods for preventing the pollution of water. I think we have lost sight, in the discussion, of our duty as health officers with regard to the keeping of our streams in their condition of natural purity. I

think it was Prof. Cheesborough, in a number of papers on pollution of streams, published in the Albany Medical Journal, edited by Dr. Rafter, who said that, speaking for himself and for sanitarians and scientists generally, we can accept as a fact that water in a state of original purity—running water, free from animal pollution—will not give us typhoid fever or will not cause disease, if we may except waters which are malarial. Speaking of our North country, I may say that, in our province of two and one-half millions, fifteen years' experience has convinced me that this is true. I likewise am convinced, as Mr. Williams has stated in his admirable paper, that no standard of chemical analysis is worth anything unless you have previously studied the individual water and established a standard to base variations upon. When this has been done, a chemical analysis becomes a most valuable aid. There is one curious fact with regard to the waters in our province, which flow down from the Northern wildness, where there are no settlements. Coming down from the Northern swamps, they contain three times the albuminoid material which is ordinarily acknowledged as allowable in potable water. We find these pure and harmless, free from danger to those who drink them, if left alone in their natural purity. We have in the border lakes, which are marvels of purity, very little chlorine, and almost no organic matter in some of them, yet, as a matter of fact, it has been stated by the reader of the paper that these waters may be dangerous, and these dangers are not recognizable by chemical analysis. The fact is very plain, therefore, when we consider all these different waters, that there must be a standard fixed for each individual water—for each particular river or lake. The value of the chemical analysis becomes doubly valuable if we add to it the microscopical and bacteriological examinations, and this is especially true of well waters, which I believe were not mentioned by the reader of the paper. Nearly every health officer, sooner or later, will have to deal with the question of the closure of wells in towns where there is public water supply. Everybody knows that a great many old wells are said to contain the purest and coldest water in the town. Every person thinks his well is the coldest and purest. In connection with this 'well' question, we had an epidemic in one of our larger towns where the town water was subterranean—water of almost standard purity for eight years. In a section of that town there was an epidemic of typhoid fever. We found the source of the difficulty in wells in the old settled part of the town which were only used in the summer. The normal chlorine, instead of being five or six, ran up fifteen or sixteen, and it was found there-

would be a very large and noticeable increase of bacteria in such a well over one containing a normal quantity of chlorine. By this method of examination we assisted the local health officers to determine what wells should be closed.

"I would like to say a word or two regarding filtration. Sand-bed filtration in Europe has been used for a number of years with very great success. In Canada the matter has been complicated by financial considerations, and we have been trying to find other and less expensive methods which will give cheaper water and at the same time pure water. In some towns they have adopted a sedimentation basin with mechanical filtration, and by investigation it has been shown that this has resulted in the bacteriological purification up to 95 to 97 per cent. In other words, if you take the St. Thomas supply, which is supplied from Kettle creek, a very muddy stream, whenever it is necessary, a four days' supply of water can be obtained from the reservoir which will not average after filtration more than 150 bacteria in every cubic centimeter. That is as low as in water taken from the middle of Lake Ontario, which I suppose might be taken as a standard. The city of Chatham has recently completed a reservoir basin which will contain a two weeks' supply. In this way pure water may be obtained at what may be called a moderate cost."

Mr. Garner S. Williams, Detroit, Mich.: "It seems possible that I have been more or less misunderstood in my remarks concerning chemical and bacteriological examinations. I do not wish to go on record as stating that the bacteriological examination is the only thing requisite for the determination of the quality of a water supply. I am of the opinion that both examinations are necessary, and that neither is entitled to precedence; but the chemical examination alone is practically of little value. In this city, in 1892, we had 209 deaths from typhoid—thirty-eight in twenty-five days, as many as five occurring in a single twenty-four hours. Chemical examination of the water was made by a chemist of reputation, and it was pronounced of excellent quality.

"The statement has been made in this assembly that the typhoid rate of Detroit is about the same as that of Philadelphia, 4½ per 1,000 living, and tables compiled by myself give that information: but in those tables there are several years in which the conditions may be termed abnormal. We now know that our water supply is influenced by what may be called foreign conditions, namely, disturbances of the channels above us by dredging—not only immediately above us, but at Port Huron and in the tributaries of Lake St. Clair. I think the normal

typhoid rate under ordinary conditions of our water supply, i. e., where there are no such disturbances, will not be over $2\frac{1}{4}$. The rate for 1890 was 1.89, for 1896, 1.96, and for 1897, 1.10.

"The matter of sedimentation has been referred to, and here I have also been misunderstood. Sedimentation is undoubtedly of great value, freeing the water both from mineral and bacteriological impurities, and it is often desirable in building sand-bed filters to have the water first refined in a settling basin. But there are waters which contain impurities unremovable by sedimentation in any reasonably short period of time, and in order to throw down a precipitate, a coagulant must be introduced, often to such a great amount as to injure the water. With a very clear water I think the slow sand filtration is the typical method, but as the water becomes more clouded we can see that either settling basins must be added or mechanical filters become more desirable. At times the combination of the three methods may be needed—sedimentation, precipitation, and sand-bed filtration.

"There is one point in regard to mechanical filters which is not exactly sanitary, but appeals rather to sentiment, and while sentiment should not be permitted to rule in these matters, nevertheless, at this particular time I hope I may be pardoned for mentioning it. It is that the mechanical filter is the development of an American idea, and as Americans we may be justified in hoping that it will come to such perfection as will warrant its general introduction. Slow sand filtration began in Europe, where it was accidentally stumbled upon, and may be said to have been born of ignorance, although the results were very fortunate, and this all happened before anything was known of bacteriology; in fact, as soon as bacteria were discovered, sanitarians immediately assumed that sand filtration was a damage to the water, and it was not until about 1890 that it was proved otherwise.

"A question has been raised as to the Lawrence filter and the results obtained. I have only to say that that filter, as originally designed, was to have an auxiliary gravel filter near the river to remove the silt and coarser impurities, and so reduce the scraping required on the other, but lack of sufficient funds prevented the construction of more than one. I do not think that this filter, built a number of years ago, in the early stages of the scientific investigation of the subject, should be taken as a criterion on which to base a judgment of the general results obtainable by slow sand filtration, as in some respects it has been decidedly improved upon in later construction.

"This matter of filtration becomes a local one, and each locality must decide for itself what is most desirable. What may be

best for Cincinnati may not be best for either Pittsburg or possibly not even for Louisville.

"The Providence experiments have been spoken of. While I have not studied those experiments as closely as some others, I did find that a portion of them were rejected in drawing the final conclusions, and while I have every confidence in the engineer under whose direction they were carried on, I have never been able to understand why three-fourths of the results were thrown away and the conclusions based on those of a very brief period.

"So far as the work at Albany is concerned, I think there must be some misunderstanding. From recent information I learn that thus far the cost of the work has been within the engineer's estimate."

Wednesday evening session adjourned at 10:30 p. m.

Thursday Morning Session.

The Conference was called to order at 9:30 by the President.

The first order of business was a continuation of the lines of work of the various State Boards of Health.

Dr. William Bailey, Louisville, Ky.: Inasmuch as the Secretary of our Board is not here, it devolves upon me to briefly state what the Kentucky Board is doing. The Secretary of our Board is its chief executive officer, practically, I might say, that he is the Board of Health of Kentucky, and those of you who know Dr. MacCormack, will understand this. He was prevented from coming here by being compelled to remain in our State to control an epidemic of small-pox, and his presence was necessary on the ground. In the mountainous districts of Kentucky, it is very difficult to control an epidemic of the kind, because the people are so ignorant. In Kentucky we are handicapped more or less by what is possibly the smallest public health appropriation of any State; it is only \$2,500. With this we cannot accomplish very much. In the control of epidemics we have to rely upon other sources of management. One plan that we have adopted this year may be of service to some of you. When an epidemic breaks out in a county we have a right to ask the county court to pay the expenses. In Jackson county, where a number of small-pox cases exist, we sent an inspector but they denied the disease being small-pox, and the county court refused to appropriate a single dollar for its control. We have adopted a method to control it in that county—we have quarantined it against all of the adjoining counties and it can have all the small-pox it wants.

Regarding the work of the State Board of Kentucky, we are handicapped by lack of money to collect statistics. From our small appropriation we employ a State veterinary surgeon and bacteriologist, but we have not been able to establish a bacteriological laboratory. By spending a little money our bacteriologist has been able to do considerable work affording to the physician of the State confirmation of diagnosis of diphtheria. We examine water supplies and may say that everything coming to us has been examined. Our community recognizes that it is proper for them to pay the expense of veterinary and bacteriological examinations because the Jersey cows and blooded horses are more valuable than people. We have not been able to obtain permission to examine our Bourbons, because they consider that all whiskies are good, some better than others, but they are all good.

Our State Board also has control of the law governing the practice of medicine. We were handicapped here also by lack of funds. This law was passed a few years ago and instead of organizing a new board the administration of the law was placed in the hands of the State Board of Health. With that wonderful executive Secretary of ours we set to work and organized a board in every county composed of physicians. Now when the time came for the introduction and enforcement of this law there was no delay and the results have been very successful indeed. There is no authority to practice medicine in the State of Kentucky save that granted by authority of the State Board of Health. A few years ago we had a great many quacks in the State; to-day there is not one so far as I know. I will say in passing that I do not think this can be said of another State in the Union. In visiting Detroit, I am perfectly at home. I recognize signs like "K-K" and "Copeland," and others that we used to have a number of years ago in Kentucky. They departed from Kentucky between the suns, but when I visit other cities and see these familiar signs, they make me feel quite at home. There has been another matter with which we have had to contend during the past year, and our experience has been that of other States throughout the West and South, and, particularly, Missouri; I refer to osteopathy. In Missouri the practitioners of this are recognized by the authorities, possibly because they do not use medicine. Objection to State Board of Health control has been made in Kentucky, and we had to take the matter before the Legislature. We went before it last year and asked them to amend the existing law so that everything pertaining to medicine in any way would be under the authority

of the State Board. The amendment was finally passed, but when we first took it before the individual members, we met with a very cool reception. In taking sanitary measures before the Legislature, we must remember that the legislators are politicians. In many instances their every action is looking towards being returned the following year. Not meeting a favorable reception from the members of the Legislature, Dr. MacCormack decided to "pull the string," and wrote to all the doctors in our State, and within twenty-four to forty-eight hours, these law-makers began to receive letters from their constituents, from five to ten to fifteen letters. Letters from doctors on their own county stating that if they wished to be returned the next year, or perhaps advanced to the Senate, or perhaps sent to Congress, that they must work for the amendments offered by the State Board of Health. At our next interview, we met with a different reception. They said after thinking the matter over they were inclined to vote for the amendment, and when it came up it was passed almost unanimously. I say to you, gentlemen, that if the doctors of the State will effect an organization and combine to accomplish legislation they can do it if they go at it right.

WORK OF THE STATE BOARD OF HEALTH OF RHODE ISLAND.

GARDNER T. SWARTS, RHODE ISLAND.

The work of the State Board of Health of Rhode Island is purely advisory. It has no mandatory powers except in the control of State quarantine in the presence of an epidemic, but is able to accomplish much in sanitary work through the power of the official name.

Owing to the spirit of our founder, the illustrious and independent Roger Williams, having been implanted in the soil of the State, and his successors and assigns having imbued from the soil and atmosphere enough of that independent spirit to prohibit the use of the word shall, it is difficult to obtain legislative control of acts which may be unsanitary. The word may be often more effective in obtaining a change of opinion than the most exacting demand of law. Freedom in civil and religious liberty is the charter of existence, and it has been recently demonstrated in the decision of the Supreme Court of the State by allowing the free operation of Christian Scientists, this body being considered as not coming under the term "practice of medicine," notwithstanding the fact that they assume the care or rather neglect of all forms of illness including the care of the mother and child in confinement.

The special work outside of the usual inspection of nuisances involving the question of town interference, has been the study of diphtheria and tuberculosis through the assistance of the advanced methods in bacteriology.

I believe that this State was the first, and following the work in the City of New York, to offer to physicians of the State to examine material from the throats of persons suspected of being infected with diphtheria, and the Board is well satisfied that this work has been of the greatest value to not only the patient, to the physician in assisting in making the

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diagnosis, but has been, from our standpoint, of great value in permitting of sure and prompt isolation and of intelligent control in placing and in raising quarantine of cases, and thus being of inestimable value to the public.

The methods employed are the same as in other States. The placing of tubes containing the culture media of blood serum, at the various drug stores, together with a swab of cotton on the end of a small piece of wire the same being enclosed in a small sterilized test tube. Cultures, or swabbings, taken from the back of the throat and placed on the serum surface from the swab will result in a growth in the serum in the incubator over night, and on the following morning a report of the character of the growth can be given to the attending physician. The report is made by telephone. The expressions "the culture does show, or does not show" the presence of diphtheria bacilli being sufficiently distinct. No mistake has ever been made in this manner of notification. It is prompt; it permits of advice to the attending physician as to quarantine, as to the use of antitoxin and permits of recommendation as to the time when a second culture should be taken, especially if the first proves to be negative and the physician believes still that the case presents the clinical signs of the disease. Cotton swabs are used instead of an unprotected wire because there is less danger of injury to the mucous membrane of the throat. The area of collection is made greater by sweeping the cotton back and forth of the pharynx. The cotton appears less formidable to the patient than the bare wire which suggests puncture and operation. The cotton will retain the secretions in greater quantity. In case the serum had become dried, the secretions will be retained in the meshes of the cotton and can be delivered to the department where an inoculation of the surface of the serum may be made in a fresh tube.

In connection with the control of diphtheria, antitoxin has been supplied to those unable to pay for the same, at the expense of the State, upon the order of a physician. It is also dispensed upon the order of the physician to those who are able to pay. This latter is an assurance that the product supplied is of correct strength and of good manufacture. The reason advanced for this paternalism in the supply of drugs is made on the ground that as antitoxin is acknowledged to be of value in reducing mortality, and as it is the duty of the State through its proper department, the Board of Health to conserve the public health, it is desirable to make use of all means available. If the poor were not supplied with the material their chances of death are increased. The chances of infection in others are materially assisted by the continuance of the disease. Money is needed for isolation and for the feeding of small-pox patients while in quarantine. The State does not in these acts pauperize, for the recipients of aid are beyond the power of rising above the plane of ability to pay for costly drugs. If the State or the public sees a person starving, they do not consider it too much paternalism to give him food and permit of gain of strength to go on with his work afterwards. Why should they not receive medical aid at the expense of the State when to aid them in overcoming a disease the control of which is demanded by the State, and also when the State is materially benefited by the dispensation of this material, the antitoxin of diphtheria.

Tuberculosis: Examination of sputum in tuberculosis; another line of work which has followed the efforts of the City of New York was the examination of sputum from cases of suspected tuberculosis, free. Possibly this is more paternalism. But if there is known to be a contagion of any kind, and the health department does not make every effort possible to ascertain the location and the conditions attending every case of such contagious disease, and if that department does not make some sort of an effort to control the disease when its presence is known, then it is culpable for dereliction of duty.

The examination of sputum is made possible of course and only through an appropriation from the Legislature for this work. The de-

tails of the work are accomplished by placing receptacles for the sputum at convenient drug stores where they may be sent for by the physician. The sputum is received by the department, the physician being required to pay express charges, the sample is examined and a report made by mail only, as this is a condition where twenty-four hours delay will not affect the patient. The issuance of the report in this way can be made more clear by printed and written advice. With the report of the case, as to whether the findings are positive or negative, is sent a circular of instructions as to the care of the sputum, which it is hoped may be placed in the hands of some friends of the patient and will ultimately be seen by the patient.

The advantage of making a diagnosis of this disease early, permits of early treatment to the patient; permits him if practicable to be removed to a more suitable climate. By such removal, the State is relieved of one center of infection. The patient does not necessarily become a center of infection in his new locality since improvement in the disease may place him in a condition in which he is no longer a source of danger to his friends. One restriction in the offer for examination has been found obligatory, and that is that the Board positively refuses to examine any specimen which is received with the contents leaking from the bottle. Many specimens having leaked out upon the receptacle and into the wrapping paper has become dried and is a source of immediate danger to the bacteriologist who makes the examination. Such samples are immediately immersed in a solution of formaldehyde and there remain.

The Secretary of the Board is, ex-officio, the State Registrar and as Secretary it becomes his duty to control the perfect report of all births, marriages and deaths.

The tendency of physicians to permit their patients to die of heart failure, dropsy, convulsions and cramps, has to be overcome by continuous demands upon them for some morbid condition which may have been the cause of the symptom named by them as a cause of death. This work is educational in a measure and brings to the department good results for the effort. Undertakers and clergymen must be coached and encouraged to comply with the requirements of registration. This work is properly placed with the Board of Health, as the work of the Board comes in most direct contact with the study of cause and effect in disease. It is impossible for the executive or State department to have that interest in ferreting out the meanings and results of poor death returns.

Unfortunately our Board does not possess the powers accorded in some other States in control of the potable water supplies. Many supplies are in the hands of corporations and some owned by cities are contaminated and yet the Board has no authority to forbid the use of the water nor of demanding the removal of the polluting sources.

One other discrepancy occurs in the interstate laws whereby there is lack of control of streams used for city water supplies and where the contamination occurs outside the borders of the State. That some interstate legislation should be established to control this danger is desirable and more so than the existing interstate laws governing commerce.

In conclusion the State Board of Health acts as the Board of Medical Registration, thus receiving a great demand of time from the Board in the issuance of certificates and in the prosecution of illegal practitioners. Whether the combination of this work with that of sanitation is desirable is a mooted and doubtful question.

DR. J. A. EGAN, ILLINOIS:

Mr. Chairman and Members of the Conference: As the etiology of tuberculosis is one of the most important topics to be discussed by this Conference, one concerning which the greater number of the delegates present may possibly desire to express their views, I will refrain from

entering into an elaborate discussion of Dr. Swarts' paper, to which I have listened with a profound interest, which has doubtless been shared by all present, and will simply devote two or three minutes to a brief resume of the points presented.

Little exception, if any, probably, will be taken by the medical men present to the statements made by Dr. Swarts in his summing up. As it has been very concisely stated by a writer, whose name I cannot at this moment recall, "the etiology of tuberculosis is centered around the bacillus tuberculosus, and where this does not enter the body, no tuberculosis can be manifested." We must, however, be continually mindful of the facts shown by Niemeyer, that consumption is so often intimately associated with conditions of disease that it is impossible to decide whether all the lesions are the widely spread results of a single process, or whether, on the other hand, the effect has been produced by separate diseases, which have, at the same time, existed in the body. It is well, furthermore, to remember that some authorities, among whom may be noted Sir Andrew Clark, take exceptions to the belief that tuberculosis of the lungs can always be explained as due to one specific cause, viz.: the tuberculosis bacillus. They claim that while the great majority of the cases are bacillary in origin, there is a considerable minority of cases, which are non-bacillary, in which at no period of the disease can the bacillus be found, and it seems that in a few cases the assertions made have been well supported by proofs.

To the claim made by Dr. Swarts, that if an infant has had the disease transmitted to it from the mother, it will not come to life, some doubt will exist. While the influence of heredity is still open to argument, and intra uterine infection must necessarily be considered rare in comparison with the number of cases infected after birth, it has been proven beyond question in cases recorded by Birch-Hirschfeld, Lehman, Bar, Renon, Keating and many others, that the organs of infants, which have died at periods running from one day to several months after birth, have been shown to contain the tubercular bacilli. Furthermore, as has been frequently pointed out as an evidence of hereditary transmission, we note the common occurrence of tuberculosis in the bones and joints of children, who do not evince other signs of disease.

The disease in not showing itself until adult life, probably imitates syphilis, the ravages of which we know are also rapid after the invasion. Like syphilis, it lies dormant for years until an exposure to cold, hardship, or to some other diseases, arouses the activity of the virus. Baumgarten's theory that the late manifestations are analogous to syphilis hereditaria tarda, and that the growth of the germ is as a rule held in check by the natural development of the tissues of the child, also seems very plausible.

"WHAT ARE THE PRINCIPAL LINES OF WORK OF YOUR BOARD? HOW IS EACH ACCOMPLISHED? WHAT MODIFICATIONS, IF ANY, DOES THE EXPERIENCE IN YOUR STATE SUGGEST?"

**U. O. B. WINGATE, M. D., SECRETARY WISCONSIN STATE BOARD OF HEALTH,
MILWAUKEE.**

In order to answer the questions set forth in the subject, it seems advisable briefly to state the functions of the State Board of Health, and to give a general review of its operations.

The legal functions of the State Board of Health of Wisconsin are principally advisory to local Boards of Health, and educational to the people. The only absolute legal power it has is in the matter of quarantine in the event of an epidemic of infectious disease. The local Boards of Health likewise have quarantine powers and rarely is the State Board called upon to act, except in an advisory manner.

The Board is composed of seven members, each appointed by the Governor, subject to confirmation by the Senate, for a period of seven years. No member, except the Secretary, receives any remuneration for his services, except his actual traveling and living expenses when in the performance of his official duties, and except in case of an epidemic of cholera, when, if he is assigned to duty at any place during such epidemic he is entitled to the sum of fifteen dollars per day and actual traveling and living expenses. This is paid out of an epidemic fund set aside by the Legislature and only to be used in case of an epidemic subject to the order of the Governor. The Secretary is the executive officer of the Board and receives a salary fixed by the Board, and is provided with a clerk and a messenger boy, which is all the clerical force the Board is provided with. The Secretary is provided with a library to aid him in his work, but furnishes his own office. The Governor is authorized by law to provide an office for the Secretary at the Capitol, if he so desires, but thus far has never done so.

The work of the Board being principally advisory it consists chiefly in advising with local Boards of Health. The State is divided into seventy counties, and each town, village, and city is required by law to organize and maintain a local Board of Health. There are over 1,200 local Boards of Health in the State. With few exceptions every town, village and city has complied with the law. Those not provided are in sparsely populated districts, principally farming districts, where no village exists and where the inhabitants are far apart. The health officer of local Boards of Health, who is to be a physician when practicable, is the executive officer. The chief work of these Boards has been to prevent the spread of infectious disease and abate nuisances, and in connection with this work the Secretary of the State Board is constantly called upon to give advice, both sanitary and legal, and he must be well versed in sanitation and sanitary law. He is frequently called upon to visit places and inspect unsanitary conditions and suggest a remedy; also may be called upon to give expert evidence in the courts. It can readily be seen that it consumes about all of his time to attend to his official duties and often he is a very much over-worked man with the limited corps of clerical help in his office. The other members of the Board act as advisory to the Secretary and executive officer, approve his acts and co-operate as becomes their station, but as they receive no remuneration except traveling expenses, they are not expected to do the work the Secretary can do and is paid for doing. The limit put upon the clerical force of the Board, and the appropriation which is but \$5,500 per annum, from which all expenses must be paid, except the printing of the small biennial report, limited by law to two hundred pages, prevents undertaking much sanitary work that other State Boards undertake. The Secretary is provided with a small bacteriological laboratory, in which he makes bacteriological tests when called upon, as in cases of diphtheria, tuberculosis, etc. When in case it becomes necessary he can refer such work to the professor of bacteriology of the State University, who is the consulting bacteriologist of the Board and who makes sanitary analysis of public drinking water, etc., as occasion requires. This work is somewhat limited, however, as the expense must come out of the appropriation of the Board. The State Chemist is, however, required by law to make chemical tests for the Board, free of charge, and frequently makes such tests. The State Dairy and Feed Commissioner under whose supervision the State chemist works, attends to the adulteration of all foods, drugs, etc., in the State. The State Veterinarian attends to all diseases of animals, and the State Board of Medical Examiners attends to medical practice, so that the State Board of Health is only required to attend to strictly sanitary work. The public health organization, consisting of the local Boards of Health and the State Board, is quite complete, and is working harmoniously. When an infectious disease makes its ap-

pearance, the machinery that can at once be put into operation is very effective. The State has been, however, during the past few years, very free from extended outbreaks of any form of infectious disease. The State Board inspects, once in two years, all State institutions as to their sanitary condition, and makes such recommendations as are necessary to the proper authorities, and these recommendations are usually promptly carried out. Within the past two years efforts have been made with a view to eradicating bovine tuberculosis in the State. A commission for the eradication of bovine tuberculosis has been formed consisting of the Secretary and one other member of the State Board of Health, the bacteriologist of the experiment station of the State University, who is the consulting bacteriologist of the State Board of Health, and the State Veterinarian. This commission has been engaged in making tests with tuberculin and has learned that bovine tuberculosis, while it is not extensive, exists more or less throughout the State. Some herds are found to be badly infected, while others are free from the disease, or only contain a few cases. The plan has been to attempt to educate the owners of herds up to the importance of attempting to eradicate the disease before it becomes more general in the State. This is being done by issuing circulars on the subject and testing herds where consent is given, and demonstrating the conditions and the results of the disease if allowed to go on without effort to stay its advance. The commission hopes to obtain sufficient data to go before the Legislature at its next session and ask for an appropriation sufficient to prosecute the work in a satisfactory manner. The commission has also made experiments which lead its members to believe that by quarantining and isolation valuable stock can be maintained by raising calves from infected mothers, and thus save improved stock. Healthy calves have been repeatedly raised from infected mothers since these experiments have been carried on, and it is believed that this will aid the work very much, for it will overcome the objection of owners to having their infected animals slaughtered if they can save their improved stock. This will be a great saving to them. We believe the time is coming when milk from an animal any way infected with tuberculosis will be condemned for human consumption, and that every milch cow must have a certificate to go with her on sale, showing that she has been tested and is free from the disease. We also believe that we can eradicate the disease from animals in our State if we can have the co-operation sufficient to enable us to carry on the work in the near future, before the disease becomes more prevalent, and can thus accomplish a very important sanitary work with much less difficulty than can be done in some of the Eastern States, where the disease is much more extensive, and from whose experience we ought to learn valuable lessons.

One of the greatest dangers that exists in our State is the lack of a compulsory vaccination law. The Supreme Court has decided that the Board has no power to make rules compelling vaccination, and hence we only have moral suasion to aid us in this important work. We expect an epidemic of smallpox as the result in due time, and the responsibility must be placed where it belongs. It surely does not rest on the State Board of Health. Another danger that exists is the tendency to drain village and city sewage into water supplies. Unsuccessful efforts thus far have been made to obtain legislation to remedy this growing evil, but we hope to succeed in the near future. Attempts have also been made within the past few years to improve the vital statistics law, and to collect more accurate vital statistics. The result of the new law which went into operation a year ago is not yet known, as a sufficient period of time has not yet elapsed in order to test it thoroughly.

This covers principally the two first questions asked, namely, "What are the principal lines of work of your Board?" and "How is each accomplished?"

In regard to the third, "What modifications, if any, does the experience of your State suggest?" I have to say that I doubt if any changes, under the present circumstances, would be of any particular advantage. The work of sanitation is a growth, and it is useless to attempt too much until the public mind is convinced of the importance of the work. The health of our own State at the present time is very good, and we believe this is largely due to the efficiency of our health organizations. The principal work in the future, I believe, should be along the lines of establishing good sanitary conditions in growing villages and cities, and the laws as they exist give the local Boards of Health practically full power in this respect. The State Board, by its advisory power, if it holds itself in the position it should, competent to give advice, and meriting the respect of the public, can do most valuable work in any State. The local Boards of Health of necessity, under our existing political regime, must change often, while the State Board is a more permanent organization, and will of necessity be required to advise with local Boards of Health, or, in other words, to educate local Boards of Health up to the requirements necessary for the performance of their duties, and in this advisory power, I believe, exists the greatest value possessed by State Boards of Health. The work of sanitation in our States is one of constant growth and education. Every generation has to be taught its principles; hence the constant need of a State Board, the principal functions of which should be to direct this course of education. In our own State we believe that our health organization is very complete for the work that is required in our State at the present time, and undoubtedly, as new work is demanded, which comes from growth and age of the State, our Legislature will provide us with laws sufficient to meet all demands. To make it more complete, a National Health Department, that would co-operate with the State health authorities in somewhat the same manner as the State Board co-operates with local Boards of Health, would make a national health system that would be as near perfect, in my judgment, as such a system could well be made, and it is to be hoped that Congress may furnish us with such a National Department in the near future.

204 Biddle street.

REPORT OF THE OHIO STATE BOARD OF HEALTH TO THE STATE AND PROVINCIAL BOARDS OF HEALTH OF NORTH AMERICA.

By C. O. PROBST, M. D., SECRETARY.

The Ohio State Board of Health from its beginning has had three lines of work specially in view: First, to establish, foster and instruct local boards of health; second, to promote public education in hygiene, and third, to obtain control of sources of public water supplies.

The Board was established in 1886. At that time the Council of any city or village could, if it pleased, create a local Board of Health. Few had done so. In 1890 we secured a law making it mandatory on cities and villages of over five hundred inhabitants to establish a Board of Health. In 1893 this law was again changed, and a Board of Health was required in each city, village and township, of which Ohio has altogether 2,056. With a few exceptions, Boards of Health have been established in all of these. Our township trustees were made Boards of Health for the township. They are allowed the same compensation as members of Boards of Health that they receive as trustees. This has helped greatly in getting sanitary matters looked after in rural districts.

Until 1893 the authority of local Boards of Health to adopt and enforce rules and regulations was derived from Council. There was often jealousy between the two bodies, causing troublesome complications. In 1893 this authority was conferred directly upon Boards of Health by act of Legislature.

For the control of epidemic diseases, and in matters of a general nature, the State Board has supreme authority, and local Boards, under penalty, must enforce its orders. Local Boards have every needed power for regulating local matters affecting public health or comfort.

The Council must pay the expenses of a local Board of Health, but the Council may create so many obstructions that when the two bodies are not in sympathy, as is frequently the case, the Board may be greatly hampered. We hope to overcome this trouble by having a sanitary fund placed directly to the credit of the Board of Health.

The State Board of Health has labored in many ways to increase the efficiency of the local Boards. The usual circulars of instructions, blanks, model by-laws, etc., have been freely supplied to them. They are furnished with postal blanks and required to send us weekly reports of infectious diseases and monthly reports of deaths. These reports are very imperfect, but they have created a desire among health officials for our greatest need—a general and efficient system for the collection of vital statistics.

The local Boards have been encouraged in looking to the State Board for advice and assistance, which almost weekly takes the form of a personal visit by a member or the Secretary of the Board.

Annually, for the past eight years, health officers and members of Boards of Health have been invited to meet the State Board for a two days' conference. The meetings have been very successful, and fully 350 delegates have been in attendance at the last two meetings.

Since 1888, except for a short period, the State Board has published a monthly sanitary journal and sent copies free to all local Boards of Health. This forms an excellent medium of communication with members of local Boards of Health, and opportunity for their instruction; but the editor of the Ohio Sanitary Bulletin feels bound to admit that, from lack of time, he has failed to make that journal all it should be.

Two duties have been constantly impressed upon the local boards: First, the suppression of contagious diseases, and second, the abatement of public nuisances. These might be stretched to form the whole sanitary garment, including the "frills," but regulations to meet the purely theoretical dangers to public health have not been encouraged.

Too great a value cannot be placed upon the services of the local Boards of Health, and a State Board of Health, however efficient cannot replace them.

Of the second line of our work I shall have nothing to say other than that by circulars, by the help of the press, by sanitary conventions, and in other usual ways, we have tried to teach our people something about how to live and let others live.

The third line of special work, while not so important, perhaps, as the others, has required the most pushing, and has therefore received considerable attention.

To the act of 1893, as it was passing easily through the Legislature (thanks to threatened cholera), was added the following provision regarding sewerage and water supplies: " * * * No city, village, corporation or person shall introduce a public water supply or system of sewerage, or change or extend any public water supply or outlet of any system of sewerage now in use, unless the proposed source of such water supply or outlet for such sewerage system shall have been submitted to and received the approval of the State Board of Health." (Law for examination of public water supplies and health laboratory, recently established.)

Under this act the Board has passed upon plans for the introduction or improvement of water supplies or sewerage systems in 137 different places. The pollution of streams has been discouraged as much as possible. Where public water supplies were liable to be contaminated by proposed sewerage works, such pollution has been prohibited. In a considerable number of cases the introduction of unsuitable water supplies has been prevented.

Works for the purification of sewage have been encouraged in every possible way. Believing that our public institutions could be made valuable object-lessons in this direction, and being easier to interest, special attention has been paid to them. The Asylum for Insane, at Toledo, and the State Reformatory, at Mansfield, have sewage disposal works in operation. Money has been appropriated and plans have been approved for such works for the Asylum for Insane at Massillon, the Hospital for Epileptics at Gallipolis, and the Boys' Industrial School at Lancaster. A county infirmary and a county children's home are purifying their sewage.

Municipal plants for sewage purification are in operation at Oberlin, Canton and Alliance. Works are nearly completed at Glenville, Fostoria, Shelby and Clyde.

With the view of obtaining more accurate information of the condition of Ohio streams, the Board has begun an investigation which is to be continued until all of our rivers of any importance shall have been investigated. A complete survey was made last year of the Scioto, Olen-tangy and Mahoning rivers. Work this year has been commenced upon the Sandusky and Maumee rivers. Monthly chemical and bacteriological examinations are made of the streams above and below all towns taking water supplies from or contributing sewage to them. A close inspection of the watershed for ten miles above each city obtaining water from the stream, noting all sources of pollution, is made by an engineer, in recognition of the wisdom of Dr. Buchanan, who said, in regard to the London supplies taken from the Thames, that while he considered laboratory examinations of the water to be of value, he placed more weight upon the reports of competent inspectors as to what was visibly going into the stream.

Ten miles above water intakes has been the limit of this special inspection, because this is the limit, in Ohio, within which contamination of a public water supply may be prevented.

The streams are also measured to determine varying rates of their flowage, the co-operation of the United States Geological Survey having been secured for this year's work.

A drainage map of Ohio has been prepared under the direction of Mr. Allen Hazen, a copy of which is here exhibited. This shows the streams, the areas of all watersheds, the population and rate of growth of all towns of over 1,000 inhabitants, the distances by water between towns, and other data most helpful in a study of stream pollution.

In the same line of work the Board has collected, with the aid of our State Geologist, Dr. Edward Orton, information concerning the quantity and quality of our deep ground waters.

A special report upon these matters has been prepared and will be ready for distribution in a few weeks.

The objects of this work are chiefly to enable the Board to properly perform its duty of approving plans for water supplies and sewerage, and to collect information on stream pollution which will lead, it is hoped, to such wise legislation as will gradually reclaim our rivers and preserve them for public water supplies.

WHAT ARE THE PRINCIPAL LINES OF WORK OF YOUR BOARD? HOW IS EACH ACCOMPLISHED? WHAT MODIFICATION, IF ANY, DOES THE EXPERIENCE IN YOUR STATE SUGGEST?

BY RICHARD H. LEWIS, M. D., SECRETARY.

In discussing the topic just read, but little time will be required for North Carolina. In our State the population is largely rural, and practical health officers, such as hear my words, understand only too well, no doubt, the ignorance of and indifference to the ordinary rules of hygiene met with among country people generally. This is not so much due to

want of intelligence—for the man who takes country people for fools will find himself sadly mistaken—as it is to the strong spirit of conservatism invariably found among people who travel little, and who pass their lives within the narrow environment of a farm. It is hard for them to take up new things. And they cannot be made to do it against their consent—not the people who comprise the citizenship of the old North State, at any rate. Having received barely a trace of the blood of the subject races of continental Europe since the State was first settled, the same blood in its purity flows in their veins as throbbed in those of the men of New Hanover, who, some time before the Boston "tea party," not only threw overboard the tea, but captured the vessels that brought it into the Cape Fear river; and of the patriots of Mecklenburg, who more than a year before the general Declaration of Independence declared their own independence of the mother country. They cannot be driven, and so they must be led.

The principal line of our work, therefore, is educational. It is accomplished by the distribution of health pamphlets; by occasional articles in the newspapers; by the publication of a monthly bulletin, which is sent to every physician in the State, the Board realizing the supreme importance of securing the aid and co-operation of the medical profession; and by popular sanitary meetings—"health conferences with the people," we call them. In addition to this, our chief work, we inspect all the public institutions and public water supplies of the State, and report to the powers in control of the same, with advice. We also furnish information on health subjects to anyone asking for it. With the single exception of authority to take charge and enforce sanitary rules in case of an epidemic of contagious disease in a town having no local board of health, our powers are purely advisory.

The only modification, in the present state of public opinion, that our experience would suggest is a larger appropriation. This would permit more work of the kind above indicated to be done, and at the same time justify the employment of the whole time of a Secretary, with an assistant as *locum tenens* in his absence. The Secretary should be a missionary of sanitation. By lectures, and by personal work with the various municipal authorities, he could do much to excite interest generally, and to promote the establishment and perfecting of local health organizations. As no law can be enforced in this country that is not supported by public opinion, it is manifest that the education of the people is the most important work any Board can do.

STATUTORY REGULATION OF THE RIGHT TO PRACTICE IS CONSTITUTIONAL.

H. Z. GILL, TOPEKA, KAN.

The exercise by the States of these statutory powers is upheld as a valid exercise of the "police power" to protect the health of the community. When the constitutionality of such enactments has been questioned, it has been attacked upon the alleged ground that the statutes under question unjustly discriminated in favor of one class of citizens and against another class, and as depriving those already engaged in the practice of medicine or surgery of "their property without due process of law." (State v. Pennoyer, 18 Atl. Rep., 878; ex parte Spinney, 10 Nev., 323; People v. Fulda, 52 Hun (N. Y.), 65-67; Brown v. People, 11 Gol., 109.)

OPINION OF UNITED STATES SUPREME COURT.

This subject has been carefully considered by the United States Supreme Court in a recent case, and the broad extent of the legislative powers of the States to regulate such matters clearly and fully declared. (Dent. v. West Va., 129 U. S., 114.) The Court says (pp. 121 et seq.), Mr.

Justice Field delivering the opinion, in which all the other Justices concur: "The unconstitutionality asserted consist in its (the statute's) alleged conflict with the clause of the Fourteenth Amendment, which declares that no State shall deprive any person of life, liberty, or property, without due process of law, the denial to the defendant of the right to practice his profession, without the certificate required, constituting the deprivation of his vested right and estate in his profession, which he had previously acquired.

"It is undoubtedly the right of every citizen of the United States to follow any lawful calling, business or profession he may choose, subject only to such restrictions as are imposed upon all persons of like age, sex and condition. This right may in many respects be considered as a distinguishing feature of our republican institutions. Here all vocations are open to everyone on like conditions. All may be pursued as sources of livelihood, some requiring years of study and great learning for their successful prosecution. The interest, or, as it is sometimes termed, the estate acquired in them—that is, the right to continue their prosecution—is often of great value to the possessors, and cannot be arbitrarily taken from them, any more than their real or personal property can be thus taken. But there is no arbitrary deprivation of such right where its exercise is not permitted because of a failure to comply with conditions imposed by the State for the protection of society. The power of the State to provide for the general welfare of its people authorizes it to prescribe all such regulations as, in its judgment, will secure or tend to secure them against the consequences of ignorance and incapacity, as well as of deception and fraud. As one means to this end, it has been the practice of different States, from time immemorial, to exact in many pursuits a certain degree of skill and learning upon which the community may confidently rely, their possession being generally ascertained upon an examination of the parties by competent persons, or inferred by a certificate to them in the form of a diploma or license from an institution established for instruction on the subjects, scientific and otherwise, with which such pursuits have to deal. The nature and extent of the qualifications required must depend primarily upon the judgment of the State as to their necessity. If they are appropriate to the calling or profession, and attainable by reasonable study or application, no objection to their validity can be raised because of their stringency or difficulty. It is only when they have no relation to such calling or profession, or are unattainable by such reasonable study and application, that they can operate to deprive one of his right to pursue a lawful vocation.

"Few professions require more careful preparation by one who seeks to enter it than that of medicine. It has to deal with all those subtle and mysterious influences upon which health and life depend, and requires not only a knowledge of the properties of vegetable and mineral substances, but of the human body in all its complicated parts, and their relation to each other, as well as their influence upon the mind. The physician must be able to detect readily the presence of disease, and prescribe appropriate remedies for its removal. Everyone may have occasion to consult him, but comparatively few can judge of the qualifications of learning and skill which he possesses. Reliance must be placed upon the assurance given by his license, issued by an authority competent to judge in that respect, that he possesses the requisite qualifications. Due consideration, therefore, for the protection of society may well induce the State to exclude from practice those who have not such a license, or who are found upon examination not to be fully qualified. The same reasons which control in imposing conditions, upon compliance with which the physician is allowed to practice in the first instance, may call for further conditions, as new modes of treating disease are discovered, or a more thorough acquaintance is obtained of the remedial properties of vegetable and mineral substances, or a more accurate knowl-

edge is acquired of the human system and of the agencies by which it is affected. It would not be deemed a matter for serious discussion that a knowledge of the new acquisitions of the profession, as it from time to time advances in its attainments for the relief of the sick and suffering, should be required for continuance in its practice, but for the earnestness with which the plaintiff in error insists that, by being compelled to obtain the certificate required, and prevented from continuing in his practice without it, he is deprived of his right and estate in his profession without due process of law. We perceive nothing in the statute which indicates an intention of the Legislature to deprive one of any of his rights. No one has a right to practice medicine without having the necessary qualifications of learning and skill; and the statute only requires that whoever assumes, by offering to the community his services as a physician, that he possesses such learning and skill, shall present evidence of it by a certificate or license from a body designated by the State as competent to judge of his qualifications. As we have said on more than one occasion, it may be difficult, if not impossible, to give the terms 'due process of law' a definition which will embrace every permissible exertion of power affecting private rights and exclude such as are forbidden. They come to us from the law of England, from which country our jurisprudence is to a great extent derived, and their requirement was there designed to secure the subject against the arbitrary action of the crown and place him under the protection of the law. They are deemed to be equivalent to 'the law of the land.' In this country the requirement is intended to have a similar effect against legislative power—that is, to secure the citizen against any arbitrary deprivation of his rights, whether relating to his life, his liberty, or his property. Legislation must necessarily vary with the different objects upon which it is designed to operate. It is sufficient for the purpose of this case to say that legislation is not open to the charge of depriving one of his rights without due process of law if it be general in its operation upon the subjects to which it relates, and is enforceable in the usual modes established in the administration of government with respect to kindred matters—that is, by process or proceedings adapted to the nature of the case." (Witt-haus and Becker, pp. 7-10, Vol. I, 1894.)

Thursday afternoon session was called to order at 2 p. m. by the President, and the discussion on "The Restriction and Prevention of Tuberculosis in its Various Phases" was taken up, and follows herewith:

RESTRICTION OF TUBERCULOSIS.—ETIOLOGY.

G. T. SWARTS, RHODE ISLAND.

It has been proposed that this discussion on tuberculosis be opened by a limited consideration of the etiology of this morbid condition.

This phase of the disease might be considered as inappropriate for introduction or discussion before a body whose shortness of time must be confined to the plane of hygiene and sanitation or preventative medicine, and by some may be considered as rather a medical topic than a matter which would interest health boards, but inasmuch as the prevention and correction of an abnormal or unhygienic condition is dependent upon a knowledge of the causation, so must the etiology of this subject be made clear that correction may be intelligently applied.

By tuberculosis we mean the condition of being affected with tubercle. In pathology a tubercle is considered as a small, granular body, varying in diameter from one-half of a millimeter to three millimeters. It is hard, transparent when fresh, quickly becoming opaque and yellow-

ish at the center. They may undergo degenerative changes to the extent of caseous infiltration or to resolution, this change beginning in the center of the tubercle. The tubercles may be isolated or massed.

While the complete stage of resolution or degeneration in phthisis or consumption was the condition to which Hippocrates* applied the term of cold abscess (caseous), and which is the Latin translation of tubercle at that time, and while observers from 1614 to 1816 (Francis de le Boc, Baillie and Bayle) associated these tubercles with a collective set of symptoms and peculiar course of disease, yet Bayle and Laennec (1781-1826) looked upon tubercle as the *cause* of consumption (phthisis). Lebert (1813-1878) described the microscopical "tubercle corpuscle," consisting of cells of free nuclei. Schonlein (1796-1848) was the first to use the term "tuberculosis." Later, Virchow, Rokitansky and many others found "giant cells," Langhans claiming them to be constant constituents, but it is now known that they are found in a vast variety of pathological neoplasms, and in the disease, phthisis, are found in advanced growths of the tubercle rather than in its acute formation.

Birch-Hirschfeld, Baumgarten and Prudden have produced these tubercles with the same cell formation as the result of the introduction into different parts of the body of such foreign bodies as silk, hair, and other extraneous materials. The introduction of these bodies artificially produces a typical tubercle, with its accompanying inflammation, nodular formation, aggregation of cells with few or many nuclei, and disintegration.

Later, in 1882, Prof. Robert Koch made the announcement to the medical world that he had discovered and established to his satisfaction that there was to be found in the center of these tubercles a micro-organism having the shape of a bacillus, and that this bacillus was to be found in cases where the symptoms clinically would indicate the presence of the disease called phthisis or consumption. Before making this statement he had not only demonstrated the presence of this organism, but he had passed it through the circle demanded by himself for the satisfactory determination of the association of the organism with the disease in which it was found, namely, the isolation and growth of the organism in artificial media, taken from the original case; secondly, the introduction of the organism grown artificially into another animal, and lastly, the reproduction of the symptoms of the disease observed in the first case, and the extraction therefrom of the same organism.

The organism itself is a bacillus—non-motile, very slender, slightly curved or bent rod. They are 0.2 micromillimeters thick and 1.5 to 3.5 micromillimeters in length. It is distinguishable from other bacilli of similar form by its individual peculiarity upon being stained with aniline dyes, as with fuchsin. This stain is not bleached out or decolorized upon the addition of acids, which do, however, bleach out all the red of the fuchsin from all other organisms present and which have received the first stain of a fuchsin.

It is now generally accepted throughout the civilized medical world that this organism is the factor in the production of the disease known as "consumption," and that without the presence of this organism the disease cannot be propagated or transmitted. That is, tubercles that have originated as the result of the introduction of irritating foreign bodies, or even by the dead bacillus itself, will not reproduce that disease when introduced into another animal unless the bacillus of the disease is present and alive.

Prudden† has shown that the dead bodies of the tubercle bacilli will produce an effect upon the living tissue which is peculiar to this germ.

* A. Jacobi, Keating, *Cyclopædia of Diseases of Children*, 1889.

† T. Mitchell Prudden, *Concurrent Affections and the Formation of Cavities in Acute Pulmonary Tuberculosis*. N. Y. Med. Journal, July 7, 1894.

and that the resulting tubercle is a typical tubercle, but differs materially from the tubercle produced by other foreign substances, as demonstrated by Baumgarten and others.

"After prolonged boiling and cleansing from soluble material by repeated washings, the dead bodies of the tubercle bacilli are, when introduced into the bodies of animals, markedly pyogenic, as well as capable of stimulating the tissue cells of the part in which they lodge to a production of new cell masses and tissues similar in structure to many of those produced by the living germs."

I dwell upon this repetition to assure ourselves of the identity of the organism with the disease, and to refute the arguments that certain trades are the direct causation of the diseases known as miners', glass-cutters', file-makers', flour-workers' and grinders' diseases, and in which it is claimed that the foreign particles emanating from the work are inhaled with the air, thus producing the degenerative and fatal disease known as *phthisis pulmonalis*.

Consumption, or tuberculosis, is not confined in its attack to the lungs, but may be found in every part of the body, invading the skin and bones. Thus we are impressed with the fact that the channels of introduction of the bacilli are not confined to the respiratory passages. Besides the introduction of the organism into the lung through the trachea and bronchi, the bacilli may gain entrance from a distant part of the same lung or from other organs in the body, through the blood vessels, or through the lymphatics.

While these bacilli have the ability to produce neoplasms and consequent destructive changes, they have at the same time the power of production of a material which has the power of a septic intoxication, and it is this material or poison which, acting upon the various systems of the body, produces the *clinical symptoms* by which we distinguish or name the disease.

That this material can be produced artificially from the growth of the bacillus in suitable media outside of the body is shown by the reaction produced when tuberculin is injected into tuberculous cattle. In the examination of the lesions found in the presence of a tubercle in its various stages of growth, and especially in the stages of decomposition, there are found associated with the bacillus of tuberculosis other organisms of decomposition. The most common forms are the *streptococcus pyogenes*, found in the presence of pus, and next frequently the *micrococcus pyrulaceolatus*. In cavity formations are found the *staphylococcus pyrogenus aureus* and *streptococcus* in adults.

Babes found, in 1891, and others later, that these pyogenic bacteria were found in nearly all tubercular lungs. We might therefore assume, as they are as prevalent as the tubercle bacilli, that they might be the causative factor, but by isolating these organisms, growing them outside of the body, and then inoculating an animal with this growth, we are unable to produce anything except pyogenic results, and find it impossible to produce tubercular formation.

It has been shown, however, that the presence of these associates often so modifies the resistance of the tissues and fluids of the body that invasion of the original bacillus of tuberculosis or the extension of those present in the lungs to any part of the body is encouraged. This is caused not alone by the toxic action of the pyogenic bacteria, but by the mechanical or chemical destruction of the cells making up the tubercle itself, and in which the tubercle bacilli may for the time be caged, as well as by breaking down the tissues and vessels in which the tubercles may be lodged.

It is by these degenerative processes that the vast amount of exudative material and broken-down tissues is encouraged to accumulate, and which must be ejected from the air-spaces in the lungs in order that respiration may be kept up.

As these accumulations contain, among other things, the bacilli which have been shown to produce the disease, it can be understood how, if the ulcerative processes break into the current of the circulation at any point, that the bacilli may be carried to other points, producing a cause of death known as, and which is commonly observed, general tuberculosis.

When this material is expectorated into the open air, the material dries with the living bacilli remaining therein. This dry dust may be wafted to a new soil, where, if the soil be favorable, a new crop or growth of the bacilli results. If it be only the individual himself who is exposed, he is simply reinfected at other points in the lungs, which localities might never have been invaded by the extension of the growth of the tubercles, nor by the presence of the moist mucous exudation accumulating in the air-spaces. This tenacious material or exudation is not readily drawn into the apex of a healthy lung. Let this moist mucus, however, become dried, and it may be drawn into the lung with the inspired air. The fact that this same dust may be carried to a recipient soil in the lung of some other person must not be lost sight of, and it is in this way that we have a most satisfactory proof of the fact that the bacillus is the causative factor.

In regard to heredity, Keating puts the statement well, that "congenital predisposition need not be identical with hereditary transmission." A congenital predisposition may be acquired as the result of a child being born to a mother who is physically a degenerate. The child from insufficient food or unsanitary environment may become a favorable soil. In later life, the dissipation attendant upon certain trades, as found with printers, barkeepers and hack drivers, or where long hours are required in an impure atmosphere, and with the ingestion of liquor, or, as in other trades, where, as in mines, factories and mills, the air is warm and dense. In the stone-cutting, steel-grinding, wool-sorting, glass-cutting, flour-milling and coal-crushing operations we are provided with the irritants necessary to commence the inflammatory production of the culture media in the lungs.

Much stress has been laid upon the value of heredity in the acceptance of risks in life insurance policies, and, although the medical examiners and head medical examiners and the actuaries of the life companies are agreed that contagion and congenital acquisition are the potent factors in the acquirement of this disease, yet they are loth to give up the proposition that, having a parent or uncle dying of consumption, it may have some influence upon the applicant's expectancy of life.

The reason for the common acceptance of heredity as a cause of this disease probably originates from the frequent occurrence of the disease at an early age, and from its recurrence in the same family. Before the acceptance of the theory of infection was advanced, heredity was the only explainable cause. At the same time, the repetition of the disease in strangers who came to live in "consumptive houses" was passed by as unexplainable.

It has been argued that, on the other hand, a perfectly healthy child might live with a family having the disease, and yet escape; per contra, it must be noted that not more than one-third or one-half of those who should have the disease by heredity acquire this disease. Not every member of a family, where one or more parents or brothers or sisters having the disease, have suffered by contact with it, although the possibility of heredity and contagion are present. Especially is the lack of heredity a factor where the members of the family are scattered, being removed from the infected cases and away from the family hearthstone, which in too many cases is the family "spitting stone."

If the disease is transmissible by heredity, why does it show itself in so many cases not until adult life? How can the dormancy of the disease for twenty or thirty years be explained, when we know that with the invasion of the disease the progress is rapid?

If heredity is the causative factor in the etiology of this disease, infants of tuberculous parents should succumb early. As a matter of fact, if an infant has had the disease transmitted to it from the mother, it will not come to life. It will be, as in animals, abortive. If the disease were present in the sperm of the male or the ovum of the female, that sperm and that ovum would be in such a diseased state that it could not mature. Virchow knows of no case where tuberculosis has developed at birth, which should be the case if the sperm were infected and matured. Keating attended the birth of a child of a tuberculous mother, born at the seventh month of the utero gestation, the child living but a few minutes. The liver of the child showed the presence of gray military tubercles.

It would seem impossible that an infant, being supplied with the blood serum which is coming from a tuberculous source, and with tissues in the lowest stage of development, with the necessary requirements of heat and moisture and a suitable soil provided in every way, should succeed in developing the disease in so slight a measure as to permit of its being born, raised and advanced to the age of from eighteen to thirty-five years, the period at which the mass of the victims succumb. If the disease is present in the infant, its vitality should be rapidly destroyed, and the evidence shows that this is the case.

If the placenta be invaded by the disease, it does not necessarily follow that the organisms of the disease may be passed through the membranes unless the continuity of the tissues is broken by the destructive changes incident to this disease. In that case, the organisms might invade the tissues of the foetus through the blood current, and there grow rapidly.

The only thing which would stand in favor of the theory of heredity is the presence of this disease in childhood so commonly shown in the form of tuberculosis of the lymph glands and the bones. It cannot be assumed that the organisms have entered the body in the usual way, by inhalation, otherwise the lungs should be the first organs to be diseased. The disease cannot readily enter the skin through an abrasion or cut, and thus infect the glands without leaving a sufficient number of the bacilli at the point of entrance to produce a tuberculous infiltration of the skin at the point of entrance.

Pulmonary tuberculosis in children over a week or two of age does not need to depend upon the question of heredity for explanation of the origin of the disease. The immediate contact with the consumptive mother by kissing, by means of rags used for wiping the mouth of the mother and the child at the same time, or by the common habit, in bottle-fed children, of testing the heat of the milk by placing the nipple in the mouth of the mother, thus effecting a direct inoculation from mouth to mouth. In such cases the transmission and point of invasion would be by the alimentary canal rather than by the lungs, the result being tuberculous enteritis, tuberculous peritonitis, or tabes mesenterica, or an association therewith, tubercular meningitis. This is probably the same course of procedure which takes place when the infant is fed upon milk from tuberculous cattle when the udder is diseased.

The presence of a weakly infant in the presence of tuberculous dust coming from the dried sputa of other members of the family is sufficient to admit of infection without the previous existence of the disease in the parent. In many instances the introduction, as we have had shown clinically, of the disease by means of milk from the diseased udder of the cow occurring in the children of healthy parents, and in the families of the well-to-do, and in the presence of perfect sanitation, mitigates against the theory of heredity.

Investigation made in 1862 by Bowditch, of Boston, led him to make the following conclusions:

"First—A residence on or near a damp soil, whether that dampness be inherent in the soil itself, or caused by percolation from adjacent

ponds, rivers, meadows, marshes, or springy soils, is one of the primal causes of consumption in Massachusetts, probably in New England, and possibly in other portions of the globe.

"Second—Consumption can be checked in its career, and possibly—nay, probably—prevented, in some instances, by attention to this law."

Buchanan, in England, also at about the same time, showed the relation between dampness of soil and phthisis, assuming them to be cause and effect.

Pettenkofer, in Germany, maintained that not only did ground water act as an important influence in the production of phthisis, but he also claimed that it was the prime factor. This opinion he retained and strongly expressed even after the evidence shown by Koch as to the cause and effect of the bacillus found in this disease, and considered that Koch's discovery had no value.

It is an accepted fact in connection with all diseases that those affected who are residing over a soil in which the ground water is high are less amenable to treatment, and the commencement of disease seems to be assisted by this condition. This is especially marked, however in all inflammatory diseases of the respiratory organs, and in the conditions known as rheumatism, neuralgia, pneumonia and malaria.

It has also been noted by these careful and able observers that a uniformly low water-level is usually healthy, and a persistently high ground water is unhealthy; but that the most dangerous condition of the subsoil water is that in which its level is subject to frequent, sudden and violent fluctuations.

It has, however, never been shown that the presence of dampness always produces phthisis *per se*, but that it will readily do so with the presence of other causes of that disease, or, in other words, with the presence of the bacillus from a previous case.

It has been shown that phthisis can be produced with the presence of other causes in certain persons in the localities which are not influenced by the changes of ground water, as in mountainous districts. It has been shown that phthisis was unknown in Iceland and Greenland until introduced by civilization.

It has been shown that bovine tuberculosis has from all ages been unknown in certain parts of the mountains of Switzerland until an attempt was made to improve the quality of the stock by the introduction of English cattle.

In connection with the work of the State Board of Health of Rhode Island in the study of prevention of tuberculosis, there is kept a card catalogue record of all deaths from this disease since 1890, both by name and residence, and in connection therewith are recorded the results of the examinations of sputum for tubercle bacilli. In this way it is noted that many cases of this disease recur in families from time to time, and also that in certain residences deaths from this disease occur in different families moving into these residences.

Among the reports of the examination of sputa since September 1, 1894, to July 1, 1898, there were 840 cases wherein the tubercle bacilli were found to be present. Of the 840 cases there were but 80, or 9.5 per cent. in which a history of the previous existence of tuberculosis in the parents could be obtained. If the prime cause is heredity, how can we explain the origin of the other 90.5 per cent. in which the disease was present?

In conclusion, and for discussion, I will assert that—

First—The bacillus tuberculosis, as described by Koch, is the causative factor in the production and continuation of the disease known as consumption, phthisis or tuberculosis, pulmonary or general.

Second—That without the presence of this organism these diseases do not exist.

Third—That while unsanitary conditions, as crowding, impure air, improper food, high subsoil water, trades involving irritation of the air passages, riotous living, and the presence of wasting diseases, may greatly facilitate the invasion of the bacillus into the system, yet in themselves cannot possibly produce this distinct disease.

MORBID ANATOMY OF TUBERCULOSIS.

DR. F. B. WYNN, OF INDIANA STATE BOARD OF HEALTH.

Bacteriology has opened the eyes of sanitary science to a new world for conquest. Whereas we were blind, now we see. The invisible enemies of mankind are found to be more numerous and more terrible than those seen. But of the many tribes of unseen foes, none is so numerous and enduring, none so widespread, powerful and hostile to man and beast as those which rally under the standard of tuberculosis. This greatest sanitary body of the Western Hemisphere has wisely and opportunely chosen as chief topic for consideration its greatest enemy. To the writer has been assigned the duty of reading the scripture as laid down in the book of science—the mere narration of facts. To others falls the preaching of the sanitary gospel—the plan of campaign against the foe. The character and allies of our adversary have been already graphically set forth. It remains for us to describe the wounds and devastations produced. So accustomed are we to them that we are not terrified as by an onslaught from cholera, which attacks a city to-day and to-morrow leaves it depopulated. Yet the tubercle bacillus has slain its thousands where the cholera germ has slain a single victim. It is only as we study the nature, frequency and extent of these ravages that we are brought to a full realization of the terrible enemy with which we have to cope.

It is but a few years since the lungs were supposed to be the exclusive seat of tuberculosis. Microscopical, culture and inoculation studies have since shown that scarcely an organ or tissue is exempt from attack.

GROSS FEATURES OF TUBERCLE.

The *sinc que non* of tuberculosis is the tubercle germ. It is the bacteriological unit as the tubercle is the anatomical unit of the disease. The former constitutes the exciting cause; the latter represents the resulting sequence of changes, constructive and destructive in character, provoked primarily by the tubercle bacillus, secondarily by other micro-organisms. The tubercle is nearly always present, but does not invariably characterize tuberculous changes. The etymological significance of the term tuberculosis is fullness of tubercles, or nodules.

In its gross features tubercle varies according to its age and tissue environment. Young tubercles are gray, old ones white or of a yellowish cast. They range in size from a pin point to a pea, the average being that of a millet seed. In bovine tuberculosis the nodules are much larger, often attaining the dimensions of a walnut or an orange.

HISTOLOGY OF TUBERCLE.

The evolution of a tubercle begins with the invasion of a tubercle bacillus. The rapidity of growth will depend on the number of germs, the kind of tissue invaded, its tone and individual vulnerability. There occurs first a rapid multiplication of the fixed cells, which are large and from their epithelial-like appearance spoken of as epithelioid cells. Generally they contain one or two nuclei; occasionally many nuclei, constituting giant cells. Notwithstanding the exuberance of cell proliferation, new capillary formation does not take place within the nodule. It remains a non-vascular growth.

Alteration in the vessels around the tubercle occurs sooner or later, leading to extensive emigration of the white blood corpuscles. They collect in great numbers at the periphery of the nodule, and many infiltrate more or less throughout its entire extent. The changes thus far are progressive. The tubercle has reached its full development, and further changes are likely to be retrograde. The cells at the center gradually die out—first the small, later the large ones. The nuclei shrivel and disintegrate. Ultimately the cellular substance may be transformed into a hyaline or granular mass, abundant in fat granules, cheeselike in appearance. Change in color likewise takes place from gray to white or yellow. This is known as caseation.

In the meantime nature has busied herself in trying to eradicate the diseased area. The rim of small round cells around the tubercle is gradually transformed into fibrous connective tissue. Nature thus attempts to isolate the focus of infection by throwing about it a sanitary wall. That it often proves effective no pathologist of wide observation will deny.

Not infrequently tubercle is invaded also by pus germs. Suppurative softening results, known as "mixed infection."

With these general considerations of the morbid anatomy and histology of tubercle we may now take up some of the multifarious organic and tissue changes which result from tuberculosis.

RESPIRATORY SYSTEM.

The common impression among the laity that tuberculosis is exclusively a lung disease arises partly from its gravity when present in these vital organs, and partly from the fact that in other organs and tissues the disease often takes a different name.

Chronic phthisis is by far the most common type of pulmonary tuberculosis. Beginning at one or both apices, it travels downwards, infecting radially, contiguous tissue by the lymph channels, more remote parts through the blood current, or by aspiration of the tuberculous matter through the bronchial tubes into different portions of the lung.

Small areas of pneumonic inflammation always attend chronic phthisis. These occur in connection with the bronchioles and around the tubercles. If the tubercles are very numerous, this inflammatory infiltration may become so extensive as to solidify the entire lung tissue, just as in acute pneumonia. The air-spaces fill with blood corpuscles, epithelial cells and fibrin, which, together with the tubercle, undergoes caseation and softening, with the production of cavities. The destructive process arises in most cases from the invasion of pus germs, although to a certain extent ulcerative changes may be brought about by the tubercle bacillus.

The cavities may be no larger than a hazelnut, or occupy an entire lobe. When freshly formed they have ragged walls, covered by caseous, necrotic and purulent debris. Chronic cavities have well-defined fibrous walls, with occasional bends passing from side to side and supporting partly destroyed blood vessels. From ulcerations of these vessels they often dilate at points and burst, with resulting hemorrhage. In nearly all cases of pulmonary tuberculosis the pleura, bronchi and bronchial glands show tubercular involvement, as well as inflammatory effects provoked by pus micro-organisms. In every case of phthisis there are tubercular masses or cavities which have been more or less completely isolated by fibrous tissue encapsulation. Cure may be effected in this way.

With some individuals this conservative effort is manifested wherever tubercular infection appears. Sanitary barriers are thus thrown up which inhibit the advancement of the disease. This form is known as fibroid phthisis, and such persons often live years. The lung may become shrunken and puckered till its respiratory capacity is practically *nil*, while the opposite lung is voluminous in proportions.

Acute phthisis, or galloping consumption, is secondary to a tuberculosis focus, which may be a cavity in the apex or a softened gland. By aspiration during respiratory or coughing efforts, softened tubercular matter is drawn into greater or less areas of the lung substance. So, from numerous new foci and the attendant round-celled infiltration and exudation, the lung may become solidified, as in acute pneumonia. The resemblance on section may be striking, and the closest search necessary to discover the military tubercles. More characteristic are the latter stages of the disease, when caseation and softening give a yellowish background, with the coarse pigmented network of connective tissue.

Secondary tubercular ulcers of the larynx and epiglottis are frequently seen by the throat specialist, and familiar to us all in the rasping, whispering voice so often noted in the last stages of phthisis.

LYMPHATIC SYSTEM.

In tubercular disease of the lymphatic glands, one of three sets is usually infected—the cervical, bronchial, or mesenteric. These are the gateways to the lymphatic system. Catarrh or abrasion of the mucous membrane is favorable to the entrance of germs. Hence whooping cough, measles and chronic intestinal disorders in children open the gates, as it were, for the entrance of the bacilli to the gland. The glands of the neck are most frequently involved. Fortunately, the disease is generally local, and tends to spontaneous cure. From septic infection the cheesy masses frequently break down, discharge, and healing takes place slowly, with the production of puckering scars, so often observed on the neck. The bronchial glands are frequently involved. Northrup found them infected in all of one hundred and twenty-five tubercular children examined post-mortem. The danger of tubercular adenitis in this region is of perforation into one of the great vessels at the base of the heart leading to general tuberculosis, or of penetrating the cesophagus, bronchial tubes, pleura, or pericardial cavities, and so cause disastrous extension of the disease.

Tubercular disease of the mesenteric and omental glands is common. Out of one hundred and twenty-seven fatal cases of tuberculosis, one hundred showed involvement of these glands. In another group of one hundred and forty-four children dying of mesenteric tuberculosis, forty-four had no ulceration of the intestines. The inference of practical value to us as sanitarians is that infection took place in these cases through the absorption of infected food—probably milk.

It would seem that the lymphatic glands are more frequently the seat of tuberculous disease than any other organ in the body. In scarcely a case of pulmonary phthisis do they escape secondary involvement, and it has just been shown that they are often primarily affected.

SEROUS MEMBRANES.

The modern trend of opinion is that most cases of pleurisy are tubercular. Fledler aspirated one hundred and twelve cases of pleurisy with effusion, of which sixty-six were found to be tuberculous. Of four hundred and fifty-one cases of pleurisy collected by Sears, 39 per cent. manifested tubercular disease. Osler found 32 per cent. clearly tubercular in character out of one hundred and one consecutive cases. Unquestionably, inoculation tests with the effusion would have shown a much larger proportion. Although gross appearances and microscopic examination may oftentimes fail to reveal a tubercular basis, all careful observers are impressed by the frequency with which pleuritic cases with effusion afterwards manifest outspoken tuberculosis.

The exudate in these cases is usually sterile; opalescent or greenish in tint, again hemorrhagic or sero-purulent. The microscope shows few leucocytes, and the bacilli are difficult to detect. Inoculation experi-

ments upon animals are important for diagnostic purposes. Tuberculous pleurisy arises by direct extension from the lungs or bronchial glands, rarely from neighboring tuberculous bone.

Tuberculous peritonitis is a primary disease in a small proportion of cases. The Fallopian tubes and intestines are common sources of infection: rarely it arises from the same condition in the prostate and seminal vesicles. The acute form is marked by a sero-fibrinous or sanguineous exudate, and the entire membrane is found studded with military granulations. The chronic type is more frequent. Large caseous nodules develop, which may sometimes be felt through the abdominal wall. The exudate is usually purulent, and may become sacculated, ulcerate and discharge into the bowel, abdomen, or through the abdominal wall. In the sclerotic type the omentum oftentimes becomes drawn into a dense puckered mass, and occlusion of the bowel results from adhesive bands.

DIGESTIVE SYSTEM.

Through abrasions of the tongue, and bathing the organ in matter expectorated from the tuberculous lungs, small tubercular areas form. These coalesce and break down, leaving a grayish, punched-out ulcer.

The tonsils are frequently the seat of tuberculosis—primarily infected through food, secondarily by sputum contaminated from other lesions. Strassmann found the tonsils invaded in thirteen out of twenty-one autopsies on tuberculous subjects; another authority in all of fifteen cases. Schlenker believes the majority of the cases of tuberculosis of the cervical gland arise through infection of the tonsils. The exposed position of the latter, and the frequency with which they are abraded and diseased, would support this view.

By direct extension from the larynx, a painful ulcerative pharyngitis often arises. Adenoids of the naso-pharynx may occasionally be tubercular. Consumptives unavoidably swallow more or less infected sputum with their food. Infective material may thus be transplanted from the lungs to any portion of the gastro-intestinal tract. Esophageal tuberculosis is rare. The most frequent source of infection is the bronchial glands. The writer recently made an autopsy in which enlarged tuberculous glands had by pressure caused esophageal obstruction and death by starvation.

Miliary tubercles of the gastric walls occur, secondary to intestinal disease, but ulceration is rare.

In a majority of cases intestinal ulceration is of a tuberculous nature. Primary tuberculosis of the intestine is limited almost exclusively to infancy—infestation taking place through milk from a tuberculous animal. Secondary bowel tuberculosis is exceedingly frequent in adults. Frenchs found intestinal ulceration in 83 per cent. of two hundred and fifty cases of chronic phthisis. In another series of one thousand cases, the bowels were affected in five hundred and sixty-six.

The regions chiefly attacked are the lower portions of the ileum, the cæcum and colon. The disease begins in the lymph nodes of the intestinal wall. Individual nodes of Peyer's glands are destroyed by tubercular ulceration, while others remain intact, giving to the patch an irregular, worm-eaten appearance. This is in marked contrast to typhoid fever, in which there is uniform ulceration over the entire area of the plaque. Ulceration extends along the course of the vessels, transversely around the bowel. Hence they are sometimes spoken of as "girdle ulcers." By coalescence of ulcers, extensive areas of the mucosa become destroyed. The tuberculous process extends to the muscular layer, and frequently tubercles may be seen just beneath the peritoneal covering of the intestine. Perforation of the bowel, peritonitis and cicatricial stenosis, with symptoms of obstruction, are not infrequent complications.

Fistula in ano often develops in tuberculous patients. Out of six hundred and twenty-six patients suffering from pulmonary tuberculosis, thirty-three, or 5 per cent. had fistula.

NERVOUS SYSTEM.

Acute tuberculosis of the brain membranes is the most frequent and important of all meningeal affections. The disease is largely confined to childhood, between the ages of one and five, although adults may be attacked. In a few cases the affection seems primary, but almost invariably it arises from some pre-existing tuberculous lesion, as of the lungs, lymphatic glands, bones or joints. The tubercular poison gains entrance to the blood and is carried to the vessels about the base of the brain; hence the disease is often spoken of as basilar meningitis. The walls of the vessels, especially about the Sylvian fissure and optic chiasm, become infiltrated with minute, milillary tubercles, which produce more or less occlusion and inflammation. There may be only a turbid serous exudate, or again it is fibrino-purulent in character. The lateral ventricles are distended with fluid, constituting acute hydrocephalus.

Tuberculous brain tumor generally develops in youth. The growth is very slow and associated with tuberculosis of other organs. They vary in size from a pea to a lemon, and are nearly always attached to the membranes. They are grayish or yellowish cheesy masses.

The insanity of phthisis is a clinical condition, familiar to every medical officer connected with the care of the insane. Every hospital for insane contains many patients suffering from pulmonary phthisis. In many of these the insanity is directly traceable to tuberculosis. Of one hundred and six insane patients suffering from tuberculosis, Mickel found thirty-six whose insanity was clearly due to this cause.

GENITO-URINARY SYSTEM.

The genito-urinary organs may be invaded by tuberculosis singly, successively or simultaneously. So far as our knowledge goes the disease seems frequently primary in these organs.

The brilliant surgical attainments of modern gynecology have added much to our knowledge of tuberculosis of the female genitalia. Winckel states that 1 per cent. of tuberculous cases is of these parts. Kelley found a tubercular condition in about 8 per cent. of all tubes and ovaries removed. From microscopical examination it was demonstrated that many of the cases of supposedly simple salpingitis were in fact tubercular. The Fallopian tubes are not infrequently affected primarily.

The disease begins at the peritoneal extremity as a catarrh in which the gray nodules soon appear, undergoing successively caseation and ulceration. From here the diseased process may extend to the cavity of the uterus and vaginal walls. The ovaries are less frequently attacked.

Tuberculosis of the testes is a common affection both as a primary and secondary disease. It begins as a dense nodule at the back of the organ, in the epididymis or testicle proper. The nodules increase in size and number and may lead to the utter destruction of the organ. The disease may ascend along the vas deferens, involving successively the seminal vesicles, prostate and bladder. The prostate gland rarely escapes in uro-genital tuberculosis. Through invasion of pus germs from the urethra it becomes the seat of mixed infection. An abscess forms which burrows extensively and opens into the urethra or rectum.

The kidney is not infrequently involved in generalized tuberculosis, the whole renal substance being infiltrated by milillary nodules. In primary disease of the organ the tubercles are generally found just beneath the mucous membrane covering the pyramids. Extension occurs into the pelvis and throughout the pyramids, ultimately involving the cortex.

Degeneration and softening take place rapidly, with the production of ragged cysts, corresponding more or less to the pyramids. In rare cases the tubercles appear in the cortex and spread slowly throughout the organ. The ureters soon manifest tuberculous thickening and ulceration. Successive infection of the bladder prostate, seminal vesicles, and testes is apt to occur.

CUTANEOUS SYSTEM.

Tuberculosis has of late years assumed great interest to the dermatologist. Several cutaneous diseases formerly supposed to be separate and distinct maladies are demonstrated to be simply varying manifestations of a tubercular process.

In a person suffering from a chronic pulmonary or intestinal tuberculosis, infection of the skin about the mouth, nose or anus takes place. Painful, superficial ulcers result. In similar manner they may arise about the orifice of the genito-urinary tracts, from infective sources higher up. Many cases of cutaneous tuberculosis have followed the Jewish rite of circumcision, in which the operator sucks the wound. Lehmann reports ten cases infected in this manner by a single operator.

By scrofuloderma is meant a tuberculosis of the skin, having its origin in the subcutaneous tissues, most frequently a lymph gland and involving the skin by extension. A circumscribed nodular infiltration, which is non-sensitive softens, becomes adherent and finally discharges a necrotic, cheesy tissue through the skin. The overlying skin is of bluish tint, the edges of the ulcer deeply undermined and its floor pale, uneven and covered by yellowish pus.

It has long been a matter of observation that pathologists and helpers about pathological institutes, conducting many autopsies are apt to acquire anatomical warts on the backs of the hands. More recently it has been observed that butchers, nurses or those intimately associated with chronic consumptive patients, or the victims of phthisis themselves, may have over the hands, knees or elsewhere, warty growths of the same character. There may be simply a roughened dry plaque, utterly wanting in inflammatory manifestations. Again the area is soft and surrounded by an inflammatory halo, with more or less hypertrophy of the papillæ in the center. Sometimes large eroded warty excrescences form, covered with putrid crusts.

Lupus vulgaris is another cutaneous disorder which has only of late years been recognized as tuberculous. It attacks by preference the exposed parts of the body, especially the face and nose which may be frightfully mutilated by the disease. The conspicuous anatomical feature is a reddish-brown nodule, located in the skin. It is softer than the normal skin, and undergoes varying retrograde changes, giving rise to the different clinical types of the disease. That lupus nodules do not show caseation is probably owing to the sparseness of the tubercle germs present. The suppurative necrosis which the nodules so often undergo is the result of septic infection, to which the parts are especially liable. All the foregoing skin diseases show in microscopic sections the histology of tubercle.

OSSEOUS SYSTEM AND SOFT PARTS.

Of all microbial diseases, next to suppuration, tuberculosis is of greatest interest to the surgeon. The older works designated this disease in bones as caries, and unfortunately the term is still in vogue. As the seat of tuberculosis the bones rank in frequency, very close to the lungs and lymphatic glands. The "hunch-back" and the stiff, deformed and useless limbs seen daily upon the streets, attest the truth of the statement most eloquently.

Children and young adults are chiefly affected. The disease is rarely if ever primary. In one hundred and fifty cases examined by Landerer, but two failed to show pre-existing tuberculosis of the bronchial glands.

The affection attacks predilection the epiphyses of the ends of long bones; frequently also the spongy parts of the vertebrae, the short bones of the carpus and tarsus; more rarely the flat bones of the skull, hips and the ribs.

Section of the bone in the earlier development of the process, shows a yellowish, somewhat clearly defined mass in the spongy tissue, in which tubercles may usually be discerned. As the nodules grow, the center softens and the liquefied contents becomes mixed with minute spiculae bone, or the degenerated bone necroses in a mass, forming a sequestrum. Rarely the node becomes incased by a dense capsule. If infection has occurred by an embolus plugging one of the terminal vessels, a somewhat triangular area necroses, and a sequestrum results corresponding to the infarct. Surrounding the sequestrum a zone granulation tissue forms, which may invade and lead to absorption of the dead bone. The rule is, however, that the mass softens and breaks into a joint, causing its disorganization; or into the soft tissue, producing a cold abscess.

Tuberculosis of the joints generally arises from adjacent bone involvement. There may be simply thickening of the membrane with miliary tubercles, unaccompanied with fluid in the joint. More frequently a pale turbid fluid, or the characteristic thin tubercular pus is present. With the progress of the disease, destruction of the articular cartilages occurs, likely to result sooner or later in fibrous or bony ankylosis of the joint.

With any form of tuberculosis of the bones or joints, infection of the soft parts may take place, producing tubercular or cold abscess. The usual order of retrograde meta-morphosis occurs—cell-death, caseation and liquefaction into a granular emulsion of fat droplets and cellular debris. The contents closely resemble, but is not true pus. In most instances, pus germs are absent. The granulation tissue at the periphery is slowly transformed into a connective tissue capsule which inhibits the spread of the infection. Evacuation ultimately takes place and healing may occur after a long period of time.

Familiar forms of bone and joint tuberculosis are known among the laity by the terms ankle disease, white swelling, hip-joint disease and Potts disease of the spine. In the last named condition not only may the inter-articular cartilages and bodies of the vertebra be destroyed, with distressing deformity, but from pressure upon the spinal cord, paralysis or other impairment of the lower extremities results. Again tubercular abscess of the soft parts develops. According to the region involved it may point in the retro-pharynx, the back, or burrowing a long distance open at the groin or on the leg, presenting one of the most intractable and distressing conditions encountered by the surgeon.

The subject has been presented in a somewhat didactic and fragmentary manner. The scope is too broad for thorough scientific detail upon this occasion. However, it has been shown that tuberculosis is at first a local disease but tends to become generalized. By marshalling before you the widespread pathological destruction of the disease, it is hoped the great truth (often lost sight of) has been made plain that, while tuberculosis finds its most frequent habitat in the lungs, it often maims and kills by attacking other parts.

If permitted again to use a martial figure of speech, I should say the tubercle bacillus is a soldier fighting at one time in ambush; again in irresistible charge. A foot-hold is gained at a vulnerable point as a basis of operation in the campaign. Once landed in the human realm, dislodgement is well-nigh impossible. Minions of living cells contest the ground but die in the struggle. The aggressive tubercle bacilli send out detachments, new posts are established, and gradually they possess the land. If a vital center is taken, the conquest is sooner achieved. More terrible, more destructive still, is the onslaught if, embarking on the great life streams from the heart, they invade simultaneously, all the vital centers. The conquest then is swift and overwhelming.

IDENTITY OF THE TUBERCULOSIS OF MAN AND ANIMALS.

By D. E. SALMON, WASHINGTON.

The identity of the tubercular process as it is observed in the various animal species has long been a question of investigation and discussion. Even before the discovery of the bacillus tuberculosis, and before the communicable character of the disease was generally admitted, observations were recorded showing that we had classed different pathological conditions under the general term of tuberculosis. Microscopical examination has shown that some of these conditions are easily differentiated, as for example the nodular disease of the sheep's intestines caused by the *esophagostoma columbianum*, and the nodular *taenia* of the fowl's intestine caused by *davainea tetragona*.

Koch's discovery of the bacillus of tuberculosis, announced in 1882, gave us a much more reliable means of diagnosis than we had had before. A hasty examination of the true tubercular lesions found in various species of animals, led to the demonstration that a bacillus existed in them having the same general appearance and the same peculiar staining reaction as had been described as characteristic of the bacillus from human sources. From this fact, the generalization was accepted, at least provisionally, that the tuberculosis of man and animals was identical in cause, in its nature, and in its communicability.

The earliest experimental data to bring this conclusion into serious doubt were obtained from a study of the tuberculosis of birds, or avian tuberculosis. It was found that the tuberculosis obtained from the organs of gallinaceous birds could only be inoculated with difficulty upon the mammalia, that the lesions produced in guinea pigs were very different from those caused by inoculation with human tuberculosis, and that birds were very refractory, in fact almost immune to human tuberculosis. A careful study of the human and avian bacilli disclosed remarkable differences. Not only did the cultures present a different appearance, but it could be easily seen that the avian bacilli were more vigorous and more resistant than the bacilli from human lesions. An avian culture six months old was still alive, vigorous, and new cultures could be made from it, while human cultures of the same age lost all power of vegetation. The human bacillus, as is well known, ceases to grow when the temperature is raised to 41 degrees C. (105.8 degrees F.), and it is killed by a temperature of 65 degrees C. (147.4 degrees F.). In contrast with this the avian bacillus grows at 43 degrees C. (109.4 degrees F.) and remains alive after being subjected to 65 degrees C. The limits of temperature for the growth of the human bacillus are about 30 degrees C. as a minimum and about 40 degrees C. as a maximum. The limits of temperature within which the avian bacillus can vegetate are about 25 degrees C. as a minimum and 45 degrees C. as a maximum. That is, while the human bacillus has a range of only 18 degrees C. (from 86 degrees to 104 degrees F.) in which it can vegetate, the avian bacillus has 36 degrees C. (from 77 degrees to 113 degrees F.) or just twice as great. These differences are remarkable and it is not surprising that they have attracted the attention of the most able investigators.

Quite recently Dubard has brought to the attention of pathologists a still different variety of the tubercle bacillus which he obtained from tuberculous fish and has named the *bacillus tuberculosis piscium*. This very interesting bacillus has an entirely different temperature range and grows from 10 degrees C. (50 degrees F.) to 37 degrees C. (98.6 degrees F.). Its limits include 48.6 degrees F. as contrasted with 36 degrees F. for the avian and 18 degrees F. for the human.

There have, consequently, been described three apparently well-defined classes of tubercle bacilli, coming from the three divisions of the animal kingdom which are characterized by low, medium and high temperatures of the blood. That is, we have now the bacillus of priscine

tuberculosis which originate in the bodies of cold blooded animals; the bacillus of mammalian tuberculosis which originate in the bodies of animals of medium temperature; and the bacillus of avian tuberculosis which originate in the bodies of animals of high temperature.

These results were, of course, unexpected and have come somewhat in the nature of a surprise. We have long known the panzootic character of tuberculosis, and we have been prepared by studies of other bacteria to find considerable variations in the biologic characters of the same species of pathogenic germs obtained from different sources; but the variations noted above, and others which we have not time to enumerate, are so great as to suggest specific differences and to lead to inquiries as to the identity of the pathologic process in these widely separated kinds of animals. Should these three groups of tubercle bacilli be considered as different species, or simply as varieties which have been developed by vegetation under different conditions of existence? Can the bacillus of the mammalian tuberculosis be changed into the bacillus of piscine or avian tuberculosis, and reciprocally can the bacilli of these latter forms be changed into the mammalian? These are most important questions, and the answers to them must have great bearing upon our future action in combating this universal scourge of men and animals.

Investigators, who have passed the avian tuberculosis through a series of mammals, have found that in time it becomes very virulent for the guinea pig and also pathogenic for the dog, at the same time losing its virulence for the gallinaceæ. That is, it may be transformed from the avian to the mammalian form. In the same manner the bacillus tuberculosis piscium has been inoculated from guinea pig to guinea pig until it acquired all the cultural, morphologic and pathogenic characters of the human bacillus. Investigation showed that the stream from which Dubard obtained his tuberculous carp has been contaminated with human tuberculosis by throwing in it the excreta and sputa of a patient affected with pulmonary and intestinal tuberculosis, while there was no evidence of contamination with avian tuberculosis.

From these facts, it appears reasonable to conclude, that although there is such a wide difference between the piscine, the mammalian and the avian bacilli, they all originate from the same source, they are but varieties of the same species, and any one of them may be transformed into any other by cultivation for a comparatively short time under suitable conditions. The tuberculosis of fish, of mammals, and of birds is one and the same disease, and although differing in such important features when affecting these different kinds of animals, these differences are only superficial, and may be caused to disappear by forcing all varieties of the bacilli to live and multiply under identical conditions.

The differences of temperature and other conditions within the bodies of fish, mammals and birds are so great that the tuberculosis germ is not easily transplanted from one to the other, and probably this only occurs naturally under special conditions. By artificial inoculation mammals have been infected with avian tuberculosis, and birds with mammalian tuberculosis. That such inoculations fail much oftener than they succeed, cannot be accepted as proving that infection from one of these kinds of animals to another cannot take place in nature, but rather that it is somewhat rare and requires special conditions. If, as Dubard supposes, the human bacilli thrown into a stream of water were able to live and infect fish; if in some mysterious manner they were able not only to preserve their vitality but to so modify their physiological requirements as to vegetate at a temperature 36 degrees F. lower than before, and to produce tumors in cold-blooded animals, then can we hardly expect that any variations of this bacillus which occur in the various species of mammalia will be sufficient to prevent the communicability of the disease between such species.

Many have supposed that the bacillus tuberculosis does not grow in nature outside of the animal body because its temperature requirements are such that they cannot be fulfilled, at least, in this latitude. It has been held, therefore, that this bacillus has been living a parasitic existence so long that it can no longer multiply except as a parasite or in laboratories where the essential conditions are maintained. These observations, however, tend to raise doubts as to the correctness of such conclusions and suggest that this microbe may be able to adopt itself to external conditions and lead a saprophytic existence. The importance of this aspect of the question from a sanitary point of view must be realized by all, but for lack of data the subject cannot be further pursued at this time.

Coming back again to the variation of the tubercle bacillus in different species of animals, you are no doubt aware that considerable differences have been pointed out in these bacilli from different sources. The human sputum bacillus and the bovine bacillus are said by some experimenters to differ in their pathogenic effects, and the former it is alleged has a tendency to produce localized lesions in bovine animals. Even if we admit these conclusions, and in so doing reject the views of other competent observers, we should not forget the wide and comparatively rapid variations which lead to the development of the piscine, the mammalian and the avian forms. With such enormous variations possible, it is plain that we cannot count upon the stability of any of the minor characters which are pointed out as serving to differentiate the sputum and bovine cultures. We may be able in certain cases to identify bacilli from these sources, even if found growing in lesions affecting various species of animals; but considering how soon the biological characters of this bacillus undergo modification from changed conditions of life, it would be rash in the present state of knowledge to say that a given germ found in a bovine animal had its source in the human or bovine body. We may admit that infection occurs more easily from person to person or from one bovine animal to another, than from the human to the bovine body. Possibly the bovine bacillus may not easily be transferred to mankind and this may have something to do in preventing universal infection from tuberculous milk. But there is nothing in the facts recorded which would warrant the conclusion that bovine tuberculosis is not transmissible to man, or that the characters of the bacilli obtained from sputum prove that the infection was from a human and not from an animal source.

Bovine animals easily hold first place among the victims of tuberculosis, and swine come next. Horses are only exceptionally affected, and sheep and goats still more rarely. With dogs and cats the disease is quite rare. Among wild animals in captivity, monkeys are probably the most frequent victims, although it is often found affecting the carnivore, such as lions, tigers, panthers, jaguars, jackals, foxes and bears. Camels, zebras and giraffes have been observed with the disease. Barn-yard fowls, pheasants, ducks, ostriches and cage birds, particularly parrots, are often affected. It is worthy of remark that the tuberculosis of parrots and of some other cage birds appears to be derived from a human source and retains its full virulence for the mammalia. It is, consequently, a most dangerous form of contagion to the human attendant.

Throughout this wide range of animal life including all from the fish to the human form there is apparently but one tuberculosis and this is caused by a single species of bacilli. The disease is more easily communicated between certain species of animals than between others, but wherever the living tubercle bacilli are allowed to exist and vegetate, there, it is safe to conclude, is a source of serious danger for mankind and the more susceptible species of animals.

STATISTICS OF TUBERCULAR DISEASES IN CINCINNATI.

BY BYRON STANTON.

[Read at Detroit, Mich., August 12, 1898.]

When I consented to report upon the statistics of tuberculosis in Cincinnati I supposed that having at my command a complete set of the annual reports of the Health Department of that city, I could, by condensing the statistics relating to such diseases, give an approximately correct report. I did not expect to be able to give figures that would exactly represent the deaths from the various forms of tubercular diseases for I well knew the difficulties that beset the physician who furnishes the certificates of death from which the reports are compiled and also of the Registrar whose duty it is to assign each case to its proper class and order, but the difficulties of my task were underestimated. In the first place there is too often the unreliability of the certificate of death. This is in some cases due to the ignorance of the person making the return, in others to unwillingness on the part of the physician or family to make known the true nature of the malady, in others to the impossibility of correct diagnosis even by the most painstaking physician, in some cases pathological conditions being erroneously attributed to tuberculosis, in others tubercular origin being overlooked.

Another cause of unreliability of vital statistics of from twenty to thirty years ago was the absence of an approved nosological classification of diseases. In more recent years this difficulty has been removed, but there still exists some carelessness or ignorance in classifying the causes of death. When the report for one year shows the deaths from specified tubercular diseases to be in one table 787, in another 791 and in a third 1,000; when one table gives 643 deaths from phthisis pulmonalis and 93 from tuberculosis pulmonalis; four deaths from tuberculosis of the bowels and one from tubercular enteritis; three deaths from tuberculosis of the larynx and one from laryngeal phthisis; when haemoptysis is classed as a tubercular disease and hemorrhage from the lungs as a local affection, we need not expect the greatest accuracy in the reports, nor is the condensation of such statistics an easy matter.

It was my desire to give full statistics from the first year of the existence of the Cincinnati Health Office, but the reports for the first eight or nine years are so imperfect that I was obliged to omit any statistics for those years. Not until 1877 was there any attempt at a systematic classification of the causes of death. I have, therefore, limited my report to twenty years, i. e., from 1878 to 1897, inclusive, and for comparison I have divided the report into two parts, each embracing ten years.

The published reports show that in the first decade (1878 to 1887), out of a total mortality of 58,480 there were 8,934 deaths ascribed to tubercular diseases, but three of these being due to rachitis and five to tabes dorsalis, I have not included them in the tables, but from the same reports there were omitted fourteen cases of Pott's disease, fifteen of morbus coxarius and fifteen of pulmonary hemorrhage which it seems to me proper to include, being no doubt of tubercular origin.

In the second decade (1888 to 1897), out of a total of 60,609 deaths, there were 8,419 assigned to tubercular diseases, but of these twenty-three were caused by rachitis, three by tabes dorsalis and 143 by mæntrasmus. As they ought to be otherwise classed, I have excluded them from consideration, but I have included for reasons above given thirteen deaths from Pott's disease, seventeen from morbus coxarius, 204 deaths from other diseases designated in the report for 1891 as tubercular, but not included in the table of tubercular diseases, and 124 deaths from hemorrhage from the lungs that were classed with the local diseases.

In regard to the classification of the last named cause of death there may be differences of opinion. Haemoptysis may be due to other than

tubercular causes, but it must be admitted, I think, that in a large majority of the fatal cases the hemorrhage is due to the necrotic division of vessels in the course of softening of tubercular disease. As the certificates of death do not generally give the cause of the hemorrhage, correct diagnosis is not always possible. Even at the bedside a positive diagnosis cannot always be made, the direct proof of tubercular origin being difficult to obtain without microscopic examination or a tuberculin test, and even these, if they were always available, are sometimes unreliable. I have, therefore, classed among the deaths from tubercular diseases all of the deaths attributed to pulmonary hemorrhage, as this gives a more nearly correct classification of the causes of death.

In regard to the deaths certified under the term "marasmus," the case is different. There are so many conditions aside from tuberculosis that may cause general atrophy that I question the propriety of such classification in the majority of cases. That some cases of marasmus are of tubercular origin, I have no doubt, but tubercular diseases enter into the etiology of this condition to a limited extent. In the adult the chronic digestive disturbances, cancer and syphilis are more frequently associated with the chronic atrophic changes. In children under five years of age tubercular origin of marasmus is extremely rare. The tables giving the ages show that more than 70 per cent. of the decedents from marasmus were under one year old and 83 per cent. under five. In the first two years of life unsuitable food, chronic gastric and intestinal catarrh and hereditary syphilis play more important parts as causal factors and from the second to fifth year rachitis may be added. As it is impossible to determine from the reports what cases are tubercular and what are non-tubercular, and as the latter no doubt greatly outnumber the former, I believe I much more nearly approximate the correct figures by excluding from the tables all deaths attributed to marasmus. As that term is so often a cloak for ignorance, it is one that ought not to be used in medical nomenclature. The deaths ought to be certified under the condition causing the wasting. Making these changes in the classification of the causes of death, we have, in the first decade a mortality from tubercular diseases of 8,970, and in the second of 8,608.

POPULATION.

The United States census returns show that from 1870 to 1880 there was an annual increase of population in Cincinnati of 3,890 and from 1880 to 1890 of 4,177. This gives an average population for the decade from 1878 to 1887, inclusive, of 265,667, of which 256,573 were white and 9,094 black. If the increase of the last decade was maintained from 1890 to 1897 we had an average population for the second decade of 307,351, of which 294,791 were white and 12,560 were black.

In table No. 1 I have given the number of decedents from each specified disease and, so far as I have been able to do so, have given the color, sex and nativity. This table shows that pulmonary tuberculosis was the assigned cause of death of 15,181 persons, or 85.7 per cent. of the mortality from tubercular diseases. Of these deaths, 7,952 occurred in the first decade out of a total mortality of 58,420 for that period, or 13.61 per cent. This represents an annual mortality of 299.3 per 100,000 of population. In the second decade there were 7,229 deaths attributed to pulmonary consumption out of a total mortality of 60,609. This is 723 less than in the first decade, but the decline is more apparent than real. In the first decade there were but three deaths attributed to "general tuberculosis" while in the second 304 were thus classed. It is asking too much to believe that certificates of death could have changed so much in that time and I have no doubt that deaths certified as occurring from general tuberculosis were classed in the first decade with pulmonary tuberculosis. This would seem to be the most natural disposition to

make of such cases, if not classed separately, for on account of the great vulnerability of the lungs the strong probability is that nearly all were pulmonary in their incipiency. But adding to the deaths from pulmonary tuberculosis the deaths from general tuberculosis we have, in the second decade, a mortality of 7,533. This is a reduction of 422 from the first decade, although there has been an increase of population, and represents 12.43 per cent. of the total mortality of the second decade, or 245.1 per 100,000 of population. In my opinion this may be attributed partly to improved methods of treatment to which step by step, the germ theory of disease has led us, but more largely to a better sanitary condition of the city brought about by the improved condition of the streets and alleys (nearly all of which have been well repaved) and to a more general attention to public and domiciliary hygiene. That this last named influence has had an important bearing is shown, I think, by the fact that the reduction in the deaths has been wholly among the whites, there being an increase of 145 in the number of black decedents—that portion of our population last and least to be reached by improvement in the home surroundings. While the colored population of Cincinnati in the first decade constituted but 3.42 per cent. of the whole, we find they furnish 8.55 per cent. of the decedents from consumption, and in the second decade, constituting 4.08 per cent. of population, they contribute 11.41 per cent. of the decedents, or to state it in another way, in the first decade the mortality from pulmonary and general tuberculosis among the blacks was at the rate of 747 per 100,000, while that of the whites was but 283, and in the second the colored mortality was at the rate of 656.8 in 100,000 while that of the whites was 217.3. If the color line were applied to the deaths from all of the tubercular diseases it would be found that the proportion of black decedents is greater, being 9.87 per cent. of the mortality from tubercular diseases.

Of the decedents from pulmonary tuberculosis 8,475 were males and 6,706 females. Although the males constitute but 48.84 per cent. of the population they furnish 55.83 per cent. of the deaths from consumption and the females, constituting 51.16 per cent. of population, but 44.17 per cent. In this respect the table differs from most mortality tables. When applied to the total deaths from tubercular diseases the proportional male mortality is greater, being 59.94 per cent.

Referring to the columns giving the nativity of the decedents I may say that as the native element greatly prevails in the earlier periods of life when the ravages of tubercular diseases are not so great, these figures have but little significance in the absence of statistics showing the relative proportion of native and foreign population of different ages. In 1870 the native element constituted but 61.19 per cent. of the population. In 1880 it was 71.91 per cent. For the twenty years the native mortality was nearly 69 per cent.

We have seen from Table No. 1 that in Cincinnati, as everywhere else, the lungs are the parts most vulnerable to tubercular affections. Next in frequency the cerebral meninges suffer, there being 725 deaths attributed to tubercular meningitis and 342 to hydrocephalus. As nearly all of the latter were, no doubt, of tubercular origin, the classification of hydrocephalus with the tubercular affections seems to be proper. Together the decedents from these diseases number 1,067, or 6.07 per cent. of the deaths from the tubercular diseases.

Hæmoptysis is the assigned cause of death in 299 cases. These, it seems to me, should be included with the deaths from pulmonary tuberculosis.

The deaths from tuberculosis of the peritoneum have been included with those from tabes mesenterica for the reason that in some of the annual reports they have been so grouped (in the first decade but two reports making any distinction). Under these two headings there were classed 344 deaths in the first decade and 246 in the second, a total of 590, or 3.35 per cent. of the mortality from tubercular diseases.

Scrofula was the assigned cause of death in 190 cases. Laryngeal tuberculosis caused seventy-one deaths, sixty-six of them being in the last decade. How deaths from this affection were certified in the first decade I do not know, but probably as cases of simple laryngitis as the deaths under that heading are less numerous since those ascribed to tubercular laryngitis have become more numerous.

Under the terms Port's disease and caries of the vertebra there were fifty deaths disposed of and morbus coxarius and tuberculosis of other joints caused 49 deaths. Five were attributed to tuberculosis of the kidneys and bladder, two to tuberculosis of the pleura and one each to tuberculosis of the pericardium, skin and pharynx. These diseases aggregate 17,568. The total deaths from tubercular diseases in the twenty years amounted to 17,578. The deaths not inculded in this report were six cases of lumbar abscess, two of adenitis and two of Addison's disease which are of doubtful classification, though all of them are generally associated with a highly tubercular or scrofulous constitution.

In Table No. 2 will be found the number of decedents in each decennial period from pulmonary, meningeal, intestinal and mesenteric tuberculosis. It will be seen that no time of life is exempt from the ravages of pulmonary consumption, 244 deaths occurring in the first year of life and 816 in the first ten years. As is the case everywhere, the decennial period from twenty to thirty is the one in which there were the most deaths—more than one-fourth occurring in this period, and in the years from twenty to sixty—the effective period of life, there occurred 76.58 per cent. of all the deaths from this dreaded scourge of mankind.

The same table shows that 28.55 per cent. of the deaths from tubercular meningitis occur in the first year of life, 54.06 per cent. in the first two years and 86.2 per cent. in the first ten years.

In submitting this report I must apologize for its imperfections—imperfections not altogether due to want of care on my part but partly to inherent difficulties from defective returns and some lack of care in the classification of the causes of death. Even with the changes I have ventured to make in the classification of diseases, the tables must be regarded as incomplete owing to the character of the certificates on which the reports are based. There can be no doubt that many of the deaths attributed to meningitis, laryngitis, hemorrhage, diseases of the spine, brain, lungs, etc., which have been classed among the local diseases were due to tuberculosis, but the defects in the returns are distributed in the same ratio as the diseases and while the tables do not give the actual figures, they show very nearly correct proportions of the various causes of death, the influence of race and sex, and the ratio of deaths at any given age. By similar reports from other places we may be enabled to determine not only the relative prevalence of the various forms of tubercular diseases and the ratio they sustain to other causes of death for the whole country, but also the influence of local and climatic conditions. When our Health authorities demand full compliance with the laws for the registration of the great events of life—birth, marriage and death, when our ministers and physicians look upon vital statistics as something worthy the attention of practical men then, and not until then, will such statistics have their full value, then will the work of the statistician be lightened and sanitary science stand on a firm basis.

Table No. 1.

DEATHS FROM TUBERCULAR DISEASES IN CINCINNATI, FROM 1878 TO 1897.

		White.	Black.	Male.	Female	Native.	For'gn.
Phthisis Pulmonalis. 15,181.	1878 to 1887	7,272	680	4,358	3,594	4,840	3,112
	1888 to 1897	6,404	825	4,117	3,112	5,207	2,022
	Total	13,676	1,505	8,475	6,706	10,047	5,134
Tubercular Meningitis. 725.	1878 to 1887	302	26	178	150	314	14
	1888 to 1897	371	26	222	175	386	11
	Total	673	52	400	325	700	25
Hydrocephalus. 342.	1878 to 1887	238	9	143	99	239	3
	1888 to 1897	99	1	59	41	99	1
	Total	332	10	202	140	338	4
Tabes Mesenteric and Tubercular Peritonitis. 248.	1878 to 1887	87	15	50	52	90	12
	1888 to 1897	124	22	79	67	115	30
	Total	211	37	129	119	205	42
Hæmoptysis. 299.	1878 to 1887	126	13	85	54	71	68
	1888 to 1897	141	19	105	55	93	67
	Total	267	32	190	109	164	135
General Tuberculosis. 307.	1878 to 1887	3	0	2	1	.....	.....
	1888 to 1897	277	27	188	116	.....	.....
	Total	280	27	190	117	.....	.....
Scrofula. 190.	1878 to 1887	90	30	59	61	118	2
	1888 to 1897	51	19	39	31	62	8
	Total	141	49	98	92	180	10
Intestinal. 96.	1878 to 1887	30	3	15	18	25	8
	1888 to 1897	53	10	25	38	52	11
	Total	83	13	40	56	77	19
Laryngeal Tuberculosis. 71.	1878 to 1887	5	.....	5	.....	3	2
	1888 to 1897	66	.....	46	20	48	18
	Total	71	.....	51	20	51	20
Pott's Disease. 50.	1878 to 1887	15	.....	10	5	18	2
	1888 to 1897	32	3	23	12	31	4
	Total	47	3	33	17	44	6
Tuberculosis of Joints. 49.	1878 to 1887	16	4	14	6	10	1
	1888 to 1897	27	2	17	12	25	4
	Total	43	6	31	18	44	5
Tuberculosis of Kidneys and Bladder. 5.	1878 to 1887	2	.....	1	1	2	.....
	1888 to 1897	2	1	3	.....	1	2
	Total	4	1	4	1	3	2
Tuberculosis of Pleura. 2.	1878 to 1887	1	.....	.....	1	1	.....
	1888 to 1897	1	.....	.....	1	1	.....
	Total	2	.....	.....	2	2	.....
Tuberculosis of Peri- cardium. 1.	1878 to 1887	.....	.....	.....	.....	.....	.....
	1888 to 1897	1	.....	1	.....	1	.....
	Total	1	.....	1	.....	1	.....
Tuberculosis of Skin. 1.	1878 to 1887	1	.....	1	.....	1	.....
	1888 to 1897	.....	.....	.....	.....	.....	.....
	Total	1	.....	1	.....	1	.....
Pharynx. 1.	1888 to 1897	1	.....	1	.....	1	.....
	Totals	15,833	1,735	9,845	7,728	11,857	5,404
17,568.							

Table No. 2.

AGES OF DECEDENTS FROM PULMONARY, MENINGEAL, INTESTINAL AND MESENTERIC TUBERCULOSIS, IN CINCINNATI, O., FROM 1878 TO 1897.

	Pulmonary.		Meningeal.		Intestinal.		Mesenteric.	
	1878 1887	1888 1897	1878 1887	1888 1897	1878 1887	1888 1897	1878 1887	1888 1897
Under 1 year.....	159	85	88	124	3	6	30	18
1 to 2 years.....	124	90	96	89	8	2	20	10
2 to 5 ".....	108	99	79	86	4	2	13	11
5 to 10 ".....	92	59	36	32	.....	1	7	3
10 to 15 ".....	120	111	6	18	.....	4	2	5
15 to 20 ".....	639	467	10	10	5	9	5	6
20 to 30 ".....	2,272	2,143	12	24	4	13	9	25
30 to 40 ".....	1,700	1,809	3	11	3	5	6	18
40 to 50 ".....	1,144	1,129	2	1	2	8	1	14
50 to 60 ".....	832	598	.....	1	3	5	8	16
60 to 70 ".....	494	380	.....	1	4	2	5	4
70 to 80 ".....	210	126	1	.....	2	1	1	2
80 to 90 ".....	49	37	.....	.....	.....	.....	.....	.....
Over 90.....	3	2	.....	.....	.....	5	.....	10
Not stated.....		100	.....	.....	.....	.....	.....	.....
	7,946	7,235	328	397	33	68	102	146

PHASE V. ECONOMICS.

(a.) What is the annual pecuniary loss in the United States due to tuberculosis in man and animals?

(b.) Does it in any way interfere with commerce and the public defense?

Dr. William Batley, Ky.: I understand that Prof. Brewer is in Europe. Some two or three weeks ago when I was requested to open this discussion I asked that a copy of Prof. Brewer's paper be sent to me that I might understand a little something about the lines he was going to argue upon, but I never received it. In the absence of the formal paper I will detain your attention but for a few minutes. When you come to consider the economics of this question you are at a loss when you try to convert into money value the loss from a given disease. The cost is so immense that we are really lost. It is estimated that about one-eighth of the human family die of tuberculosis. I am inclined to think that from the increased number of affections which are now known to be tuberculosis that this ratio should be increased to about one-sixth. I believe that is nearer than the ordinarily accepted average of one-eighth. One-sixth of the human family then die of some form of tuberculosis, and this gives one basis upon which to work. So far as I am informed, the value of human life, man, woman or child, is averaged at a thousand dollars. I would call your attention to the fact that most tuberculous patients die about the time they become of use. We must not only consider the value that has been placed upon a human life as an average, but consider the investments that have been made in the care and education of the child up to its maturity. All of these expenses naturally increase the value of a human life, the more especially between the ages of twenty and thirty. The value of a man who has been killed in a railroad accident is generally estimated at about \$5,000. But figuring on our first basis of \$1,000—on this conservative basis, the death loss from the preventable diseases in the United States alone would amount to two hundred million. Out of seventy million of people who live to an average age of 30 years (but by modern sanitation this has been increased of late years) more than a million die annually, and one-sixth of this or more than 100,000 die annually from tuberculosis.

Now by employing a little arithmetic, and multiplying this by one thousand dollars we have one hundred millions of dollars loss from death alone, annually. Now when we take into account the value of these people who die of consumption you must also take into account an average illness of two years and the expense of taking care of them for that length of time; they have to be supported, and their doctor bills and other expenses incident to long illness, and the amount would far exceed the sums appropriated for the Spanish war or perhaps even for pensions in this country.

Now this brings us to comparisons. We get a little epidemic of yellow fever and fifty millions of dollars would probably not compensate, nor one hundred million of dollars, on account of commerce lost in two, three or four months, and yet how few die of yellow fever! But tuberculosis is in our midst all the time. We do not think of estimating its cost; it is so common we have come to look upon it as a visitation of Providence and consider a consumptive wasting away as simply preparing more and more for that life beyond. Even in our literature, when we want to make the men or women more interesting, and more especially a woman, we gradually kill her off with consumption.

As to the loss in the lower animals from tuberculosis, I cannot make an estimate. The loss from cattle alone is enormous. But there is one feature about it that most strikes us: it is always the most valuable animals that are condemned. A cheap grade of cattle was never known to be afflicted with tuberculosis or killed by a railroad train. They are always the best cattle and the best horses.

The second part of the question: "Does it in any way interfere with the commerce and the public defense?" It undoubtedly would interfere and does interfere seriously with commerce, if we consider the question as bearing upon infected meat. One tuberculosis carcass going into a foreign country would cause entire exclusion of our beef from that country, a very serious matter when we consider how much food we desire to furnish Europe. I am not prepared to give the figures but they would be very large indeed.

As to the question of public defense and our ability to maintain our position among the nations of the world I am inclined to think that it would make no difference. Dewey goes out and captures a fleet and Sampson another one with no loss, and I guess our public defenses are all right.

THE NERVOUS SYSTEM IN RELATION TO TUBERCULOSIS.

By U. O. B. WINGATE, M. D., MILWAUKEE.

The wise husbandman considers the character and quality of his soil as well as his seed. In these days of germ theory and germ knowledge there seems to be a strong tendency to lay much stress upon the germ in the causation of most diseases, but little attention is given to the condition of the human system in this relation. We all admit that the bacillus tuberculosis is but the seed of that pathological condition termed "tuberculosis" and from which nearly one-seventh of all deaths are estimated to be caused. The bacillus tuberculosis is not a hardy germ and is easily destroyed under certain circumstances, and it must have a favorable soil in which to develop. We know this micro-organism is often present in various parts of the human body, and that the disease—tuberculosis—does not always result from its presence. Either the system is in such condition that the germ cannot multiply or it is quickly destroyed by certain normal processes going on in the body. It has been doubted by some observers that the bacillus tuberculosis is the prime cause of tuberculosis, and it is firmly believed by some very careful and able students that the bacillus is but a factor in the causation, and that in considering the methods of prevention of this formidable disease we must consider other factors than the germ.

That the nervous system under certain conditions may have much to do as a factor in the causation of tuberculosis I have no doubt, but to what extent is unknown, but I believe investigations along this line of observation would be profitable and should be instituted. Professor Thomas J. Mays, of Philadelphia, claims that tuberculosis is the result of a degenerative process of the nervous system and that the bacillus tuberculosis is but a small factor in its causation. So far as I know the arguments put forth by Dr. Mays, only a few years ago, have not been successfully refuted. My experience in the care and treatment of tuberculosis for the past quarter of a century, and it has been my fortune to observe its course in an average number of cases in general practice for twenty years, and for five years in neurological work, together with cases in my own family, convinces me that there is a close relationship between tuberculosis and the nervous system. That certain conditions of the nervous system are not the result of tuberculosis I am convinced for I have yet to observe one inheriting tubercular tendencies, or in other words, having tubercular ancestors, that did not show evidence of some nervous malady and often this is present in a very marked degree, showing itself perhaps a long time before tuberculosis could be diagnosed, or perhaps existing in those who had tubercular ancestors and never developed the disease themselves, or having developed it, recovered by early and appropriate treatment. These nervous manifestations are exhibited in a multitude of ways, but the most conspicuous form that I have witnessed is a depression of nerve energy which has a marked tendency to impair nutrition of the individual, and this condition, we all recognize, is the most favorable for the development of tuberculosis, for in our attempts to remedy this disease our first, and perhaps most important indication, is to improve the nutrition of the patient. There is a great tendency in these individuals who inherit tubercular tendencies to crave stimulants, either alcoholic or drug, and they often fall victims to such habits, and this comes from a weakened condition of the neurons, and in such conditions I have been told by the patients that they never felt well, in fact life seemed almost unbearable unless they were under the influence of some artificial stimulant or narcotic. This condition is often the cause of inebriety and is as much a disease as insanity. From these conditions we will often observe a long list of other nervous manifestations, resulting from this nerve depression, such as hysteria in its multitudinous forms, neurasthenia, epilepsy, chorea, melancholia, etc., etc., and I am convinced that this condition of the nervous system is a very important factor in the causation of tuberculosis and is a subject to which we should give much more attention than we have in considering the best and most complete methods of prevention.

204 Biddle Street.

Thursday forenoon session adjourned at 12:45 p. m.

CARE OF EXPECTORATION.

By C. B. JOHNSON, M. D.

Conceding that about one death in seven is due to tuberculosis; that this disease is not distinctively hereditary; that it is infectious and communicable; that its primary cause is the tubercle bacillus; that its common form is pulmonary consumption; that each victim of pulmonary consumption hourly liberates with his sputa millions of tubercle bacilli; that myriads of these bacilli retain their virulence after the sputa has dried; that this dried sputa becomes a component part of the dust about our houses, our dooryards, our public buildings, our streets and highways; and finally, that this infected dust, wafted hither and thither by every passing breeze, contaminates the atmosphere and virtually converts it

into a carrier and distributor of disease and death—conceding the truth of these statements, is the sanitarian any more justified in permitting, without protest, the contamination of the air about him with tuberculosis sputa than he would be in wantonly allowing the infection of drinking water with typhoid or cholera dejections? From the standpoint of responsibility, is there any difference between a typhoid or cholera bacillus finding its way into the body with the water we drink and a tubercle bacillus reaching its point of attack with the air we breathe?

As sanitarians—guardians of the public health, if you please—is it any less our duty to protect the air we receive in our lungs from a most deadly infection of one kind than it is to guard the water we take into our stomachs from a dangerous infection of another?

What would be thought of a householder who, night after night, with persistent regularity, locked, barred and bolted the front door against burglars, while he invariably left open the lower sash of a window just beside the barricaded door? Nevertheless, is not the conduct of this foolish householder exactly paralleled by the sanitarian who by word and deed strives faithfully to prevent the entrance of disease by the esophagus, while at the same time he gives it wide-open admission, so to speak, by the trachea. Is it not time we were learning the lesson of consistency in establishing our defenses against the encroachments of disease? Shall we not henceforth barricade the hitherto open window no less than the doorway of approach?

Upon the laity, as well as upon the rank and file of the profession, let us seek to impress the all-important fact that tuberculous sputa is deadly and destructive, and should be disposed of the same as any other dangerous infection.

In all instances this sputa should be destroyed by fire, or rendered inert by disinfectants, and to the attainment of this all-important end, physician, nurse and patient should conscientiously lend their united efforts. In the home, in the hospital, in the sanitarium, the proper care of sputa is comparatively an easy matter. But, unfortunately for the sanitarian, the great majority of consumptives are found neither in the well-regulated home, the hospital, nor the sanitarium, but as a body they constitute what, for want of a better name, we may denominate walking or traveling cases, each and all bent on expectorating when and where they please.

Instructed by his physician, and stimulated to his duty by an enlightened public sentiment, the intelligent and conscientious phthisic will care for his sputa wherever he may be. In lieu of a more pretentious receptacle, bits of toilet paper, pieces of old muslin, handkerchiefs made of cheese-cloth, will serve to receive his sputa till he reaches a place where it can be destroyed by fire or other efficient means. Meanwhile, he will faithfully guard his face, hands and clothing against contamination.

But the ignorant, careless, willful victim of phthisis will have to be dealt with differently. By both law and precept he will have to be taught the lesson that in a certain sense he is his brother's keeper, and that however innocuous his fresh, moist sputa may be, the moment this sputa dries it becomes a most dangerous source of infection.

However, the judicious sanitarian, while earnestly striving to prevent the spread of disease, has no thought of making the phthisic a thing to be shunned, as it were, and an outcast from society, for, with his sputa properly cared for, the victim of pulmonary consumption can go where he will, and those about him will be none the worse for his presence.

And now a few words in the way of epitome, and I am done: Consumption, the "great white plague," the relentless destroyer of mankind: Its cause, the tubercle bacillus. Its wholesale disseminator, tuberculous sputa. Its ultimate extinction the sanitarian will strive to effect by arousing the profession, by educating the people, and by securing wise legislation.

CONTROLLING THE USE OF MILK AND MEAT FROM TUBERCULOUS ANIMALS, AS A MEANS OF PREVENTING THE SPREAD OF TUBERCULOSIS.**H. M. BRACKEN, MINNESOTA.**

The sale of milk from a tuberculous animal should be absolutely prohibited. It is a common idea that so long as the udder of a cow is not involved in the tuberculous process, the milk may be free from infection, but this is not safe reasoning, as demonstrated by various observers, and so ably set forth by Dr. Ravenal in a paper read at Philadelphia in 1897, before the American Public Health Association.

There is but one way to control the sale of milk from tuberculous cows, and that is through control of the dairy. The selling of milk should be permitted to those only who have a statement from the proper authorities setting forth the fact that their cow or cows are free from tuberculosis. The tuberculin test is the only reliable means of determining the presence or absence of tuberculosis in a given cow. All cows should therefore be subjected to the tuberculin test, and those that respond to this test should be rejected as milk-producers, and placed in quarantine. There are some cattle so thoroughly infected with tuberculosis that they fail to respond to the tuberculin test. Those animals can generally be condemned on the clinical symptoms, without resorting to the tuberculin test.

A single test of a cow or cows should not be considered sufficient. Cattle that are free from tuberculosis to-day may be affected at some later date. Milk-producers should be tested every six months, if possible, and at the farthest not more than one year should be allowed to pass without a re-test. Dairymen should not be forced to bear the expense of these tuberculin tests. The tests are made chiefly for the good of the public, and therefore the expense should fall upon the public, either through municipal or State authority. There should be no attempt to compensate a dairymen financially for the loss of a tuberculous milk-producer. Such a course would make it of little importance to the dairymen whether his dairy cattle were tuberculous or not. Let the dairymen understand that the financial loss associated with the existence of tuberculosis in his dairy herd rests upon himself, and he will quickly become one of our most important aids in eliminating this disease from his herd.

Boards of Health, State and municipal, should be looked upon as the friends of the dairymen in his attempt to eliminate tuberculosis from his herds. They should take particular pains to urge upon the dairymen the necessity of buying only such cows as have stood the tuberculin test. They should also point out the existing dangers in a stable that has formerly contained tuberculous animals, explaining the possibility of infection from such a source. They should also insist upon the fact that cattle poorly housed, poorly fed and poorly cared for are more liable to infection than are cattle receiving the reverse of such treatment. They should not only point out these facts, but should insist that all dairies must come up to a certain standard in cleanliness, air-space and ventilation, and that certain foods (commonly known as slops) should be excluded from use in a dairy. Dairy cattle should be as well housed, groomed and fed as the thoroughbred horses in our well-kept stables.

It may be said that the dairymen cannot fulfill all these demands and sell milk at the present price. Quite true. Let him raise the price. No one, not even the poor man, can reasonably object to paying a little higher price for milk, providing he can be assured that the higher-priced milk is safe as an article of diet, when the lower-priced milk is not safe as such. If necessary to protect the dairymen financially, Boards of Health establishing a standard for the dairies might reasonably be expected to fix the price for the milk produced at such dairies.

It has been stated that all cattle responding to the tuberculin test should be condemned as milk-producers. It does not follow that all cattle responding to the tuberculin test should be condemned as meat-producers. They should be kept under strict quarantine, however, and killed under careful inspection.

Cattle that have a very limited area of infection may respond to the tuberculin test. They at once become unsafe as milk-producers. At the same time they may be in good flesh, or a sufficient time may be granted the owner to fatten them, provided strict measures are taken to prevent the cattle from passing out of quarantine.

Such cattle should be slaughtered under inspection, and the carcass passed or condemned, according to the judgment of the inspector. We should go still further, and say that all animals intended for meat should be killed under inspection. Prudden, in his little book, "The Story of the Bacteria," says, on page 73: "It is almost inconceivable that any man not wholly given over to the spirit of the devil should be capable of sending into the market meat from tubercular cattle, if he is aware of it. Yet there is reason for believing that a very considerable amount of such diseased meat is actually sent into our large towns every week, with the full knowledge of some of the unscrupulous dealers, and probably consumed, usually by the poorer and more ignorant classes." We all know this statement to be a true one. There is but one way to prevent it, viz., by establishing a strict inspection, both ante and post-mortem, as is that carried out under the Bureau of Animal Industry in the inspection of meats for export. The inspectors should be of as high a grade as are those under the Bureau of Animal Industry, and should be under the control of the State or municipal Board of Health.

In reviewing this subject, the following points are before us for consideration:

1. Milk should only be used from cows that have stood the tuberculin test.
2. Dairies and dairy cattle should be under constant inspection.
3. All cattle slaughtered should be subject to a thorough inspection, both ante and post-mortem.
4. This work should be under the control of Boards of Health.

VENTILATION AND OUTDOOR LIFE.

E. A. GUILBERT, M. D.

My view is that such a paper as this should be suggestive, not exhaustive. In other phrase, that it is intended to be simply an outline, introduction, to the topic awaiting discussion. This theory is not exactly in accord with hygiolatry, but it is one that does not undervalue time and is not unmerciful to a congregation of essayists full of deliverances which wait on utterance. I am requested to speak on one phase of this anatomization of the subject of tuberculosis—that is to say, on the relation borne by "ventilation and outdoor life" to the prevention, management and cure of pulmonary consumption. "The thing that has been, it is that which shall be; and that which is done is that which shall be done; and there is no new thing under the sun," said an aforesome "preacher," whose wisdom was God-like and inspiring, and who "held the mirror up to nature" with an impartiality unexcelled by any other teacher "until Shiloh came" to construe, apply and enforce those sermons of the olden time, breathing into them the Ruach-ha-kodesh—the breath of the Divine Spirit—"for the glory of God, that the Son of God might be glorified thereby."

The germ theory itself, which holds the profession in duress again in these days, and which is being made to play so prominent a part in the discussion of pulmo-tuberculosis, is a theory redivivus. It has come

down to us from the many-sided Varro, who lived and studied, wrote and voluminously published in the century before Christ; and who, during the numerous military campaigns in Asia Minor, in which he participated in middle life, was in position to have had access to the secrets of the Egyptian hierarchy, and might have got in that treasury of a wonderful civilization the hint on which, in his eighty-first year, in his book "De Re Rustica," he succinctly spake, thirty-six years before the Christian era. Down through historic Leuwenhoek, the keen-visioned Dutch physicist, the admitted father of modern microscopy, whose discoveries, made with glasses of his own unproved construction, were seized upon, nearly two hundred years ago, by medical men in search of novelties, and were finally converted into a germ theory which dominated the crude medical schools of the time, fighting valiant battles for its life for about fifty years, winning victories and sustaining defeats, but always "bobbing up serenely" again, quite in the line of modern events, until, after a picturesque career of near fifty years, it was finally killed by iconoclast Buffon.

So in the matter of "ventilation and outdoor life," now being considered in this notable symposium of thought and expression—no new deliverance can be tendered the skilled symposiasts now in this presence, forasmuch as they "know whereof they affirm," and whose aim is, when discussing hygienic questions, to do so from the standpoint of that pregnant motto—the motto of the Iowa State Board of Health: "The Health of the People is the Supreme Law." Briefly, then, the value of adequate room-ventilation and a well-regulated outdoor life in the prevention, treatment and cure of pulmo-tuberculosis, cannot be overestimated. Those who for years have been in the habit of observing this insidious scourge, which frequently is born of "the mind diseased," as well as a persistent violation of the law of right-living, and have invoked the aid of the good goddess of Hygiene in the medical conduct of cases, have often seen cause to "thank God and take courage" because of the marked results the effective combination has secured, even in seeming unfavorable cases. There was more in the sanitary teachings of that best of bare-footed friars, the late Father Kniepp, than is dreamed of in the philosophy of many. Since his passing they have not died, but live on, to be unmoved by the thoughtful and judicial minds of this and kindred bodies—the good being preserved for the armamentarium of the profession, the false being relegated to—

"A limbo large and broad,
The paradise of fools, to few unknown."

That is to say, to the mass of theory wreckage with which the shore of the sea of medicine is so thickly strewn. The mission of the latter-day sanitarian has become one of conceded public moment. It has back of it "an exceeding great army" of intelligent lay supporters. Despite the indiscriminating paternalism which the unwisdom of Sir Oracles is attempting to foist upon it, the science has received the lionage of all thoughtful people, and has achieved imperial powers under the law. Hence the humblest health official can now speak and be heard, and, best of all, when he speaks he will be heeded by all who are fit to live. The day has gone by when physicians and well-informed laymen look complaisantly on the practice, which dies hard, of immunizing consumptives in close rooms, amid unsanitary surroundings, depriving them of God's sunlight and His blessed air, thus expecting to circumscribe the ravages of this scourge. Hence have sprung up the numerous health resorts of this decade, where the sick are introduced to hygienic apartments, to a carefully regulated outdoor life, including consistent chest- and general athletics, not forgetting, either, that best of all passive exercises, horseback riding; where exercise is not directed by ironclad rules, but is adapted to the case in hand, not the case to it; where the medical director, the house treasury and the cook are in sweet accord,

and taste and assimilability "sit at meat" in amity; where common-sense direction of habits of life, clothing, care of the person, rest, sleep, room temperature, diet, and the form and quantity of daily physical exercise are made the subject of medical prescription; where, in fine, these most important adjuncts are in evidence—that is to say, a site at the proper altitude, where undue and pestiferous humidity and sudden climatic changes are exceptions, not the rule; not forgetting that in this picture of an ideal asylum for consumptives we find its arboreal surroundings to be composed of the various and aseptic conifera, whose

"Boughs always are singing
Old songs with new gladness,"

As they exhale a

"Balmy breath that dost almost persuade
Disease to break her sword."

In sanatoria thus environed and thus scientifically policed, have we not often seen it demonstrated that Ramage was not daft when, about seventy-five years ago, he wrote his book, "Consumption Curable"? Yet Ramage's work and its substantial results were done and secured in a London hospital for consumptives, which, though for that day well adapted to its purpose and admirably conducted, "was not of the fashion of these times," to whose workers "much has been given," and of whom "much will be required." I know that these sanatoria are closed thoroughfares to the many. They are, in private hands especially, costly luxuries, which are only within the reach of the rich or the fairly well-to-do. And I know, likewise, that into "the short and simple annals of the poor" uncounted episodes of help have been made to enter by unobtrusive medical men, who knew their duty and did it well, unconscious sanitarians as they were, and whose successors, in town and country, possessing added and varied information, often put to shame the tyrannies of putative Health Board magnates, who are long on theory but short on practice. Of course, it is to be understood that in all these matters relating to change of climate, choice of asylum, and cetera, experienced medical men should be consulted, who would direct that a patient in an advanced stage of tuberculosis be not suddenly transported from an altitude, for example, of a thousand feet above the sea to the several hundred per cent. higher altitude of Colorado; but, per contra, that he should be carried thither slowly, by successive stages, to the end that rarefaction and tolerance might have time to become correlated, and the sick chest be not encumbered with its assistance. One form of outdoor life which is of value has, I think, in the clamor of the health resort business, been lost sight of latterly. I allude to "a life on the ocean wave" as it was lived in a New England fishing smack—not the pampered life on a fashionable ocean greyhound, with its "sassity" trivialities, its unwise gluttonies and its petty extortions. I recall a remarkable case in point. Late in April, 1858, a gentleman of repute, who for years had led the life of a clerk in a Surveyor-General's office, after some months of increasing invalidism, consulted a physician for a harassing loose cough, considerable purulent expectoration, emaciation, night sweats, and cetera. He was of medium height, narrow-chested, and of not robust physique. The bodily machinery was evidently running down. The familiar picture of disease was ominous—a prognosis which physical examination of the chest confirmed. He was a most intelligent gentleman, not too intelligent, by the way, to listen to reason; hence he was an obedient patient, for he was a believer in and an exemplifier of Franklin's proverb, "God helps them who help themselves." A few weeks of medical and physical treatment decidedly modified his trouble and reawakened his hope of living. An entire change of life-methods and climate seemed to be indicated. Therefore, his physician prescribed a journey to the harbor of "the blarney stone of New Eng-

land," directing him there, or thereabouts, to board a fishing smack and go on a cruise for cod. He cheerfully acquiesced and promptly departed. He was gone two months, sailing in a comfortable boat, with a congenial captain and crew, and he roughed it with the best, never, however, forgetting his daily bath of sea-water, his vocal gymnastics, and cetera. He returned to his Western home so browned, erect and physically improved that he was hardly recognizable. He has never entirely lost his cough, nor the evidences of cardiac hypertrophy, but he lives to-day, in fair health, and in the active discharge of the duties of the office of Secretary of the City Board of Education—an office he has filled with signal efficiency for thirty-eight years. His is not an exceptional illustration of the fact that consumption is not incurable in rural or civic private practice, without quarantine attachments, as the experience of the profession attests.

So the conclusion of the whole matter is this: That house and personal cleanliness are "next to Godliness;" that damp dwellings are as pestilential as they are avoidable; that no house is fit for human beings, especially a consumptive, to live in, that is buried in foliage, or is not open, from its atrium to its penetralia, to adequate sunlight by day and the air of heaven by night; that fair ventilation is possible in even the humblest abodes without subjecting the sick to menaceful draughts; that the consumptive, yet able to get around, should be taught the value, the limitations and the modus operandi of legitimate athletics, seeing to it that—

"Digestion waits on appetite,
(Appetite on judicious exercise,)
Health on all."

But, above all, we should remember that "an ounce of prevention is worth a pound of cure," and that the old Latin axiom, *obsta principiis, oppose the beginnings*, is a golden rule which is founded on reason, whose other name is common sense, and should be followed out to its logical deductions as often as opportunity opens the way.

REPORTING OF CASES.

DR. FELIX FORMENTO, LOUISIANA.

Among the preventive measures against the propagation of tuberculosis mentioned in the programme of this Conference is one requiring the reporting of cases. This measure is eminently wise and proper, and should be strictly enforced in every community. Reporting of all cases of tuberculosis should be made compulsory by law, as in the case of diphtheria, smallpox, yellow fever, or any other dangerous contagious or infectious disease. It should be the duty and legal obligation of the attending physician to report to the proper sanitary authorities all cases of tuberculosis coming under his notice, whether it affects the lungs—the most common form—the bowels, or any other organ of the body.

The ravages of all contagious and infectious diseases combined do not compare with those of tuberculosis—that universal, merciless enemy of humanity, which recognizes neither climate nor boundary, and respects neither race, age, sex nor social position. The dangers of tuberculosis cannot be too often brought to the attention of sanitarians and the public, and the fact that it destroys one-eighth or more of the human race cannot be too strongly emphasized. Why is it less an object of terror than so many other diseases?—yellow fever, for instance, a disease which affects only certain sections of country and only at certain seasons, and whose mortality is comparatively trifling. Simply because we are accustomed to the prevalence of tuberculosis, and are surrounded on all sides by its walking victims. Or is it because it kills more slowly and in-

sidiously, and its death scenes are less tragical? It creates less impression on account of its slow progress and chronicity, in marked contrast with the acute course and rapid ending of yellow fever.

Our efforts towards limiting or stamping out this frightful disease should be encouraged by the fact that tuberculosis may well be classed among the preventable diseases—and we can already notice a great improvement, with still more promising results, in those localities which strictly enforce all rules and regulations governing the sanitary management of the disease.

This preventive measure of reporting cases is as important, as necessary as those which require the destruction of sputa, the disinfection of houses, and the prevention of sale of tuberculous milk and meat; in fact, reporting of cases is the first requisite, the first step which leads to the enforcement of all other known measures of prevention. Without proper notification to the sanitary authorities, how can the house be disinfected and the family and inmates instructed with regard to the proper precautions to be taken in order to prevent contagion and the spread of the disease? For there exists to-day no doubt as to its mode of transmission. Tuberculosis is a contagious disease, transmitted chiefly by the dessication of the sputum, which contains the tubercle bacilli. Molecular parts of this sputum are suspended in the air, and are the direct agents of infection. This requires for its development certain unsanitary conditions, certain individual predisposition, which is either inherited or acquired; the bacillus requires a certain favorable soil for its growth. Is this not the case with all disease germs, and, in fact, with all germs in general? The want of this favorable soil explains why contagious and infectious diseases, as common as they are, are not still more so.

Every physical and moral condition which depresses the system, whether due to bad hygiene, previous disease, a weak constitution, whether congenital or acquired, tends to prepare the soil for favorable development of the bacilli. Heredity plays such an important part here that until recently consumption was considered as a fatally inherited disease. Now, the real cause of the disease having been well demonstrated to be the bacillus, we say that the soil is transmitted or favored by heredity, but not the disease itself. Even in such a favorable hereditary soil, tuberculosis would not develop were it not transplanted by contagion from some tuberculous person.

According to Courmont, the bacillary toxines passing through the placenta do not infect it directly, but exert a certain influence upon the tissues of the foetus, thus diminishing their vital resistance. But in addition to the direct hereditary or congenital morbid influences, there are other factors to be considered which have a direct bearing upon the future development of the child. We all know that the advanced age of parents, as well as their consanguinity, are very apt to produce weak and delicate children. Repeated gestations, occurring at short intervals, will give rise to the same results. The tubercle bacilli, transplanted in children born under similar circumstances, will find in their weakened organisms a favorable soil to their development. For the same reason, all causes of physical degeneracy in parents, such as alcoholism, epilepsy, etc., may be said to be predisposing causes to tuberculosis.

Extreme poverty, privations, excessive fatigue, mental sufferings at the time of conception or during pregnancy, have also, undoubtedly, a great influence upon the development of tuberculosis. This fact has been demonstrated in a striking manner by the observations made by the physcians of Paris upon the children born during the siege of 1871.

Now, it is consoling to know that the natural power of organic resistance to the action of infecting germs may be so increased by good hygiene as to resist successfully their most insidious attacks. Good hygiene may so improve and modify the soil as to sterilize the germ im-

planted into it. But in order to accomplish the greatest amount of good, the salutary influences of hygiene must be applied from early infancy. Tuberculizable children should be given a healthy, robust wet nurse, or at least an abundance of pure, good milk, and raised in the country, spending the summer months on the seashore, or in the mountains, whenever practicable.

The maritime sanatoria for scrofulous and delicate children established in France and other countries have given excellent results, restoring to health numbers of children apparently destined for a premature grave. Good alimentation, abundance of fresh air and sunlight, the use of cold baths, gymnastic exercises, every hygienic practice which tends to strengthen and harden the body, are the most powerful means of correcting and modifying all morbid predisposing influences.

In the striking words of Peter: "True prophylaxis consists in making a peasant of the town-child, changing city life into country life, leaving the closed dark room for the open field and sun exposure, the warm debilitating bath for cold, running water, active life instead of rest and leisure, muscular exercises in preference to intellectual studies—in one word, leading a natural life."

Now, we repeat, can all these prophylactic measures, or any of them, be carried out without previous reporting and registration of all cases of tuberculosis by the attending physician? No. The sanitary authorities should be acquainted, so to speak, with the pathological history of every family and of every house in the locality over which they preside. It is as much their duty to look after the sanitary interests of their fellow-citizens as it is the duty of the priest and minister to provide for and look after the spiritual wants and interests of their congregations. All cases of preventable diseases should at once come under their notice, so as to enable them to immediately institute all known methods of prophylaxis applicable to the individual and family, as well as to the locality itself.

In addition to measures of isolation, disinfection and house sanitation, the family, those surrounding the patient, and, when practicable, the patient himself, should be informed by circular or through the family physician of the nature and character of the disease, of the dangers of contagion or infection, and, above all, of the proper prophylactic measures to be taken in each individual case. Fortunately, in regard to tuberculosis, these measures are neither harsh nor cruel, and do not require forced isolation and separation of families. By the proper destruction of the sputa, confining the patient to his room or rooms, disinfecting and washing his clothing, bed linen, towels, etc., separately from those of the family, and not using any of his table or toilet articles, and other such measures, much good can be accomplished. Circulars with explicit instructions on all such subjects should always be on hand and distributed among the people. The proper method of raising tuberculizable children should be brought to the knowledge of all, and should be strictly enforced in orphan asylums and charitable institutions. But the efforts made by Boards of Health to limit the spread of tuberculosis should not be confined to precautionary measures in the sick room and to proper instructions to the patient's immediate attendants. In many cases the locality, or the house itself, in which occurred cases of tuberculosis, calls for active measures of local sanitation.

In the April number of the Ohio Sanitary Bulletin we find a very interesting article bearing upon this subject. It shows conclusively that a house, once infected, may, under certain conditions, remain a center of infection and a source of danger for an indefinite period of time. It is so instructive and interesting that we here reproduce it "in extenso." This article is entitled "The Home of Consumption," and incidentally demonstrates the absolute necessity of reporting all cases of tuberculosis to the health authorities:

"Consumption is essentially an indoor disease. There is great probability that the germ which causes consumption is quickly destroyed

when freely exposed to light and air. And while the practice of expectorating or spitting on the streets is to be deprecated, the great danger comes from such material being cast into dark, unventilated rooms, where the germs may live for an unknown time, probably for years. It will be noted that the house referred to below, in which fifteen persons—probably, and thirteen certainly, died from consumption or tuberculosis, is very damp, and the cellar in bad condition, and furthermore, it is surrounded by dense foliage.

"It has long been known that dampness is a factor in the production of consumption, probably acting as a predisposing cause. It has been shown a number of times that sub-surface drainage and consequent drying of the soil has lowered the death-rate from consumption where a wet soil had been the condition theretofore. The dense foliage spoken of would cut off both air and light. Such a house, becoming infected, would remain a center of infection for a long time.

"Following is the communication from Dr. Gaston:

"Mineral Ridge, Ohio, March 29, 1898.

"Dr. C. O. Probst, Secretary State Board of Health, Columbus, O.:

"Dear Sir—Relative to the house in this village, mentioned some time since, which has sheltered so many tubercular victims, I enclose you a history of the same as nearly correct as I could obtain it from various sources. I am informed that it was thoroughly disinfected about one year ago; that the building is very damp and cellar in bad condition; that in no way will other residents of the town be satisfied until it is fired. The mother refuses to give up the house, although urged to do so by the remaining children. The local board has discussed this matter, and now asks the State Board to take such action as they deem best in the matter. The residents of this place look upon the home with horror, and if the family were to move out, I have no doubt that the building would go up in flames inside of twenty-four hours, and not a hand would be turned to save it.

"**HISTORY OF A HOME.**

"This house was constructed about 1830, and was occupied by a family of the name of F. It is related that a young man who lived with the family was "always ailing and in delicate health," but the only death was that of a baby with bowel trouble. They resided in the premises until about 1846, when the house was occupied by a family named S. They were an unusually strong and healthy family when they first came to this place, with no previous tubercular history. The first one connected with this family to pass away was a lady boarder, but information does not reveal the cause of her death. It was quickly followed, however, by the death of two sons, two daughters, father and mother, from tuberculosis, leaving only one son, who had previously gone to Illinois on account of his health, and who still survives. From 1879 until now the house has been held by the present occupants. There is no history whatever of consumption in the family prior to their coming to this house. The daughter who died recently was born there. Her death was the seventh in the family in as many years from pulmonary tuberculosis. A sister, two brothers and a mother survive, but the characteristic traces of the disease are plainly visible in the faces of one brother and the surviving sister. The building is a story and a half high, and is surrounded by dense foliage.

Yours truly,

"JAS. E. GASTON, M. D."

"No doubt there exist such infected houses in many of our cities and towns, and many of us have witnessed, on a smaller scale, such instances of transmission of the disease from a permanent center of infection."

CONCLUSIONS.

1. The reporting of all cases of consumption or tuberculosis is a measure of prime importance, which should be made compulsory by law in every locality, as much so as the reporting of diphtheria, smallpox, yellow fever and other contagious and infectious diseases.
2. It should be the duty of all Boards of Health, as soon as notified, to take all proper precautionary measures, whether applied to the individual or to the house itself, against the spread of the disease.
3. Health Boards should prepare and distribute to all interested parties circulars containing instructions in regard to the sanitary management of the patient, the sick room, the family and surroundings. The co-operation of the attending physician is greatly to be desired, and should be solicited in every case. Education and persuasion will accomplish more than coercive measures.
4. Placarding or flagging the infected premises is not required, nor is it necessary to remove the patient from his family.
5. A proper registration of all such cases, with the sanitary history of the infected house, as far as practicable, should be kept by the sanitary authorities, but in no case be made public.
6. This Conference of State and Provincial Boards of Health should pledge itself to recommend and enforce the above-mentioned prophylactic measures.

HOW MAY THE OBJECTIONS OF PHYSICIANS AND PEOPLE TO REPORTING TUBERCULOSIS BE OVERCOME?

By HENRY B. BAKER, M. D.

[Read before the Conference of State and Provincial Boards of Health, at Detroit,
August 10-11, 1898.]

The correct answer to this question is very short and very simple; all that is necessary is to educate the people generally to a knowledge of the facts, and of the importance of the subject.

My belief is that the main objection by the most intelligent physicians to reporting tuberculosis is because such physicians fear that it will cause their patrons annoyance. If their patrons generally demanded that tubercular diseases should be reported, or if they approved of that course, I believe that the best classes of physicians would willingly aid the public health service to the extent of reporting cases of well-developed consumption—that is to say, all cases of tubercular disease which have reached the stage in which the disease may be readily spread, as it is, by means of the sputa of coughing consumptives. If this proposition is true, as I believe it is, then the way to overcome the objections of the better classes of physicians is to induce the patrons of those physicians to approve of reporting tuberculosis.

In such States as Michigan, where any ignoramus who can buy a diploma in Chicago for thirty dollars can register with the county clerk and practice medicine, there are many doctors (it is hard to call them physicians) who do not know that tuberculosis is a communicable disease. With all such persons, education as to the modes of spreading the disease is as important as is the education of the people generally.

The education of the people generally must include (1) knowledge of how consumption is spread, (2) how it may be restricted, and (3) why it is necessary that every case shall be reported.

A good law is a powerful educator. As soon as a considerable proportion of the most intelligent people gain the knowledge which I have mentioned, it will be practicable to enforce a law which shall require prompt report of every case, after which the education of the masses of the people can be proceeded with; because the education of the masses of the

adult population cannot be pushed very fast except by means of reports of cases, so that leaflets telling how consumption is spread can be sent direct to persons in the immediate vicinity of a consumptive. When the disease is actually manifest in one of their associates, people can be induced to read such leaflets; at other times such literature is likely to find its way into the waste-basket much sooner than when the danger of the disease is apparent.

I believe that in Michigan a sufficient proportion of the intelligent citizens now have such knowledge of the communicability of consumption that the law which requires householders and physicians to report to the local health officer every case of "disease dangerous to the public health" can now be enforced. I think that the most important duty which now devolves upon local health officers in Michigan, and in all States and Provinces where the people generally are as intelligent on this subject as they are in Michigan, is the enforcement of the law requiring every case of well-developed consumption of the lungs to be reported. My belief is that if this were now generally done there would soon be very little, if any, opposition on the part of the people, and physicians would have no more difficulty than they do with any other dangerous communicable disease.

On this point—the intelligence of the people of Michigan with reference to this most important disease—I wish to present to you some important evidence. I have here a diagram which accurately represents the death-rate from consumption in Michigan, according to the statistics collected and published by the Secretary of State. You may notice that (although the death-rate fluctuates, as it does from all the communicable diseases, and there are waves and depressions in the line) the death-rate was never below 100 per 100,000 persons living until the year 1891, and that since 1891 it has not been above 100 per 100,000 persons living, except in one year (1895), and then it was not as high as the average of all of the years preceding 1891. You see that something has occurred to change very materially the death-rate from consumption in Michigan. I claim that the main factor in causing that very great reduction in the death-rate from consumption is the enlightenment of the people of Michigan on this subject, and I think the facts, some of which I will now mention, warrant that belief. Please notice that the reduction began in 1891, and in that year the State Board of Health, believing that the work it had been doing for several years had sufficiently prepared the people to receive it, published thousands of copies of its four-page leaflet on the restriction and prevention of consumption. Copies were sent to every physician in the State, to every health officer, to every newspaper, and to health officers to distribute to the friends and associates of consumptives. In every year since 1891 the leaflet has been distributed; thousands of copies have been thus used. The death-rate has been greatly reduced. I believe there is a relation of cause and effect between the work done for its restriction and the restriction which is proved to have occurred.

There is other evidence to support this view. The statistics published by the Secretary of State show that during the years while the State Board of Health has been working to educate the people of Michigan how to restrict scarlet fever, the death-rate from scarlet fever has been reduced, so that it is much less than half what it was before.

The statistics published by the Secretary of State show that the death-rate from typhoid fever has been reduced during the years since the education of the people on that subject has been in progress.

Smallpox has been very greatly reduced during the years that the education of the people has been in progress.

Diseases that effort has been devoted to have decreased; other diseases have not. Consumption was observed for many years when the people did not know how to restrict it, and no such reduction as that re-

cently occurred; as soon as the information how to restrict it was widely published to the people, the mortality from the disease has been reduced.

I submit that if the intelligence of the people is sufficient to cause such a noticeable reduction in the death-rate from consumption as has apparently from that cause occurred in Michigan, it is sufficient to uphold the physicians of the State in reporting the disease, so that the enlightenment of all classes of people may go on at a faster rate.

But where the law is as in Michigan, where every householder is required to report dangerous diseases not already reported by a physician, health officers can first undertake to enforce that law relative to householders. If this is done, very soon, I think, it will be found that physicians failing to report will be criticised by their patrons, because the law provides that the penalty cannot be enforced against a householder if a physician has already reported the case.

No local health officer should arbitrarily and dogmatically commence to enforce such a law without first giving ample public notice of his intention to comply with and enforce the law. After giving such notice, if the prosecuting attorneys will themselves comply with the law, there should be no difficulty in proceeding to obtain reports of well-developed cases of consumption. Other cases of tuberculosis do not involve much danger to the public health.

Sooner or later there must be the enforcement of a law requiring that every case of well-developed consumption shall be reported, because no amount of effort toward education will induce all the people to report. But, as I have already affirmed, in order to get reports of every case of consumption, the people must be educated, and in order to gain the ear of the masses, notices of cases must be made.

One other method of sanitary education of the people has lately been inaugurated in Michigan, from which much good is expected. I refer to the new law which requires that there shall be taught in every year in every public school the modes by which the dangerous diseases are spread and the best measures for their restriction. After a time this method would, in any State, result in overcoming objections of physicians and people to reporting tuberculosis. The law is a very important one, and cannot be too highly commended.

STATE AND MUNICIPAL CARE OF CONSUMPTIVES.

BY S. A. KNOFF, M. D.

In a paper on the prophylactic treatment of pulmonary tuberculosis, read before the American Climatological Association at the meeting of the last medical congress in Washington, in 1897, I said: "To prevent pulmonary tuberculosis we must begin with treating the child *in utero*." Mr. President and gentlemen, the State and municipal care of consumptives must also begin with the child *in utero*.

This is not the place to discuss the prophylaxis in regard to the procreation of a tuberculous progeny, which must, according to our present conceptions of law and ethics, remain the delicate task of the family physician. The duty of the sanitarian and the government in regard to the consumptive poor commences with the care of the tuberculous mother after conception. All I may be privileged to say here is that, according to the experience of prominent obstetricians (foremost among whom I wish to mention my two late and much-regretted teachers, Professor Lusk, of New York, and Professor Tarnier, of Paris), intervention after a tuberculous conception for the purpose of cutting short the duration of gestation, and thus saving the mother's life, has proved disastrous in the majority of cases.

During my visits, some years ago, to many of the sanatoria for consumptives of Europe and of our own country, I inquired into the results

obtained by the hygienic and dietetic treatment in those places in cases of pregnant tuberculous patients, and I learned, to my surprise, that a goodly number of these women not only did remarkably well during their pregnant state, but bore healthy children and continued to improve generally. Dettweiler, Rompler and Wolff have kept some of these tuberculous mothers under their observation for years, and no relapses were noted. The only conditions, *sine qua non*, in such cases are the artificial feeding of the child, or, better yet, giving the latter the benefit of a healthy wet nurse, and a prolonged and persistent treatment of the tuberculous condition of the mother under the best hygienic surroundings. Thus, it seems to me, the best policy for the government would be to create institutions, which might perhaps justly be called "maternity, sanatoria," where the tuberculous mother, coming from our tenement districts, should be taken at least a few months before her delivery, and should remain until some time after complete recovery from her child-bed.

The beneficial effect on the woman's and child's constitutions through such an arrangement can hardly be overestimated. Leaving aside the physical well being thus largely assured to mother and child at a period when their organisms need the most tender care, the hygienic training which the mother will have received in such an institution will be of lasting utility to herself and child, to the family, and to the community.

These maternity sanatoria need not be situated at a great distance from the city. All that would be essential is that they should be erected on good porous ground, preferably somewhat elevated, and in a locality where the atmosphere is as pure as possible. The buildings should be constructed according to the principles of modern obstetrical science and modern phthisio-therapy. The physician in charge should be experienced in both these branches of medicine.

The knowledge gained by the mother in the maternity sanatorium will, in all probability, suffice for her to bring up the infant as a relatively strong child and protect it from the dangers of tuberculous infection. But the inherited predisposition may still remain, and at the time the child begins to go to school the State should again make provisions. I have learned by private inquiry that a pregnant woman who has the misfortune to be syphilitic or tuberculous has great difficulty in gaining admittance to maternity supported by private contributions. I know from official sources that tuberculous children are not only unwelcome in public schools, but are not infrequently refused admittance, on the ground of being afflicted with a contagious disease. If I am not mistaken, it was in Toronto that the right of the municipality to refuse a tuberculous child admission to a public school was tested for the first time before a court, and sustained on the ground of the contagious nature of the disease.

I do not wish to question the wisdom of this judgment, but I should like to know what is to become of the child if its parents are too poor to pay for private instruction? The child cannot return to the public schools, for its disease is a chronic one and may last for years. If the municipality refuses the benefit of an education in the ordinary public schools to such a child, does it not become an imperative duty to provide special schools for tuberculous children?

Schools, however, in the ordinary sense of the word, would do but little good to such a child. In France, Belgium, and some other European countries, there have existed for years sanatoria for the treatment of tuberculous children, maintained by the municipalities. Attached to all these institutions are regularly established schools. To provide a place where tuberculous children and the children of tuberculous parents—the weaklings of the flock, as they are graphically called by my friend, Dr. Irwin H. Hance, of Lakewood—shall be taken care of be-

comes the duty of the government. In these school sanatoria the children will have a chance to be cured, if possible, of their disease or their predisposition, and at the same time they will receive the education which the State owes to all the children of the community. The majority of these school sanatoria may be advantageously placed on the sea-shore, for it seems a well-established fact that the tuberculous manifestations in childhood, which are most frequently observed as joint tuberculosis or tuberculosi of the bones or of the glands, do remarkably well in marine climates.

The selection of such children for sanatorium treatment would be the task of the school physician, and one should be attached to every public school. He, seeing the children daily, in order to prevent the introduction and propagation of acute diseases, will soon discern between the robust and well-nourished and the weak, dyspeptic, and not infrequently underfed pupils. These latter will, *ipso facto*, always be, or become candidates for tuberculosis. If they are placed in time under good hygienic care, their chances of becoming strong and healthy citizens will be materially increased. For children suffering from pulmonary tuberculosis an institution could easily be annexed to each of the larger mountain sanatoria for consumptive adults, of which I shall speak presently.

But before doing so, let us ask ourselves, Is there really need of the State and municipality taking care of the tuberculous poor adult? This question has been answered by the greatest sanitary authorities of all civilized countries with a most emphatic yes. Dettweiler, Leyden and Liebe have spoken for Germany; von Schrotter for Austria; Grancher, Letulle and Petit for France; Weber, Lindsey and Walters for England; Hansen and Saugmann for Denmark and Sweden; and in the United States we have in Bowditch, Hamilton, Biggs and Prudden, Lee, Trudeau, Flick, Hinsdale, Otis, Shrady, and others, strong advocates for the establishment of State and municipal sanatoria for the care and treatment of the consumptive poor.

The crowned heads of Europe, such as the Czar of Russia, the Empress of Germany, the Emperor of Austria, the King of Saxony, the King of Sweden, and the young Queen of Holland, have placed the sanatoria for the consumptive poor under their high protection, and have opened their private purses for their support. The nobility and the leaders in finance, art and literature have been eager to imitate the noble example set by their sovereigns, and the latter, too, have given freely toward the erection and maintenance of such institutions. Thus, in the countries just mentioned, a number of establishments now flourish which are doing a world of good by curing the curable tuberculous cases and taking care of the hopeless ones, thus diminishing countless centers of infection. Let me advise again, as I have before, the statesman, physician or philanthropist who doubts the need of such institutions in the United States to visit the consumptive poor in the tenement districts of our large cities, and study the hygienic and social conditions of these sufferers in their surroundings. Let him watch some of the tuberculous families. After lingering a year, either the mother or father dies of consumption, and the remaining partner, having become infected by nursing the companion, dies a year later, after having buried half of the children, who have succumbed to tuberculous meningitis.

I am sure these visitors will emerge from the dark, dreary rooms and the crowded, unclean houses which serve as habitations for millions of poor people, thoroughly convinced of the urgent need of measures to relieve these consumptive sufferers. Let these doubters also experience the difficulty of gaining admittance as a tuberculous patient into a general hospital supported by private charity, or let them watch the rapid decline the poor consumptive often makes, even if he has been fortunate enough to be admitted to a general public hospital, and they will become

still more convinced of the urgent need of creating special institutions for this class of patients.

It will be clear to them that something must be done in the interest of the sick as well as in the interest of the still healthy portion of the community.

But how can this be done, and done effectually? What class of patients should the State or municipality take care of? Only the curable or only the incurable ones? Only the poor or also those of moderate means?

If any government is in earnest in its endeavor to combat tuberculosis effectually, besides its regularly enforced laws against bovine tuberculosis, its thorough hygienic and prophylactic measures against tuberculosis in man through sanitary regulations and public instruction, it must take upon itself the care and treatment of the curable and incurable cases of tuberculous patients, among the poor and among those of limited means. I mean here by limited means a financial condition which does not permit a tuberculous patient to enter a private sanatorium or to have at home such medical, hygienic and dietetic care as will assure him the best possible chance of recovery.

The next point to be considered would be how to recruit the patients, and how to discriminate between the proper and improper cases, and thus avoid increasing the dreadful and degrading abuse of medical charity, from which we all, and especially the general practitioners, suffer so much in these days.

Permit me to present to you a few suggestions in connection with these problems. Just as there exists in nearly all States or municipalities a commission or a number of special examiners for the purpose of determining who is a proper subject for State care in an asylum for the insane, so should there exist a commission for the determination of admission to a municipal or State institution for consumptives.

Such a commission, composed of a certain number of general practitioners and health officers, should be aided in its work by the charity organizations. Each and every case should be investigated by a combined committee of physicians and laymen, for the following purposes:

1. To determine the applicant's condition by a medical examination.
2. To visit his home if he has been found tuberculous, and to institute such hygienic measures as seem necessary (distribution of pocket spittoons, disinfectants, etc.).
3. To examine the other members of the family in order to find out if any of them have also contracted the disease, and if so, to counsel proper treatment.
4. To report in full to the sanitary authorities concerning the condition of the patient's dwelling. Its renovation or even destruction may become imperative when it is evident that tuberculosis has become "endemic" there, owing to the condition of the soil or to other sanitary defects.
5. To determine the financial condition, whether the patient is or is not able to pay, and whether or not by his being taken to an institution the family will become destitute.

If the latter should be the case, it would become an imperative duty for the municipality to provide for the family. In many cases a letter of inquiry, sent to the former medical attendant of the patient, would materially aid the work of the investigation committee.

Any individual should have the right to present himself for examination, and every physician should be at liberty to recommend any person for examination to the board of his precinct or district.

The institutions needed to carry out this plan would be:

1. A centrally located reception hospital and dispensary. The dispensary should treat the ambulant tuberculosis patients, whose admission into the sanatorium is impracticable or has to be delayed for want of room. These dispensaries should also serve the patient discharged from the sanatorium as a place to seek counsel, and thus aid in his continued improvement or guard against approaching relapses.

2. One or several city sanatoria, located in the outskirts and if possible in a somewhat elevated region where the atmosphere is known to be pure. Here all patients should pass through a preparatory sojourn before being sent to the mountain sanatorium. The more advanced cases would all be retained here.

3. One or several mountain sanatoria at no greater distance from the city than three or five hours by rail, at an altitude, if possible, of between one thousand and two thousand feet, on porous ground with southern exposure, and as nearly as possible protected against the coldest winds, preferably surrounded by a pine forest. A farm in the vicinity, where the thoroughly convalescent patients could do light work, might make the institution in a measure self-supporting. To this place the selected incipient and the improved cases from the city sanatorium should be sent to complete their cure. To the mountain sanatorium there should, also be attached a department for children suffering from pulmonary tuberculosis.

4. Several seaside sanatoria for the treatment of children afflicted with tuberculous diseases of the joints and other tuberculous (scrofulous) manifestations.

5. A maternity sanatorium. Of the requirements of such an institution I have already spoken.

By this plan you will see that I am in favor of treating tuberculous patients near their homes, and in the same or nearly the same climate as that in which they will have to live and work after their restoration to health. My reasons for advocating such principles are founded on the experience of all modern phthisio-therapeutists, who have demonstrated that the hygienic and dietetic treatment in closed establishments is feasible and successful in nearly all climates. I know from personal observation that cures of pulmonary tuberculosis effected in our ordinary home climates, which are in the average not considered as especially favorable to this class of sufferers, have been more lasting and more assured than cures obtained in more genial climes. And I may perhaps say right here that, with all due deference to the opinion of others, I do not believe there exists any climate which has a specific curative quality for any form of pulmonary tuberculosis. Climate can only be considered a more or less valuable adjuvant in phthisio-therapeutics, but not a specific.

It is, furthermore, my firm conviction that for social and economic reasons the majority of tuberculous patients will have to be treated near their homes. Only by adhering to this principle can we expect to cope successfully with tuberculosis—this disease of all climes, but which is most prevalent in large centers of population, where civilization has seemingly attained the highest standard. For this reason a corresponding development of sanitary science and the widest diffusion of the knowledge of hygiene are indispensable wherever men mass themselves together in large urban communities.

That through the presence of properly conducted sanatoria for consumptives not the least danger can arise to the vicinity where such institutions may be placed, I have endeavored to demonstrate in several of my previous writings by citing the official statistics concerning the mortality from tuberculosis for forty and for one hundred years, respectively before and after the establishment of sanatoria for consumptives in certain villages in Germany. To be brief, I will only summarize these statistics here by saying that in the two villages, Goerbersdorf and Falkenstein, where five of the largest sanatoria are situated, the mortality from tuberculosis has actually decreased among the village people more rapidly and more largely than anywhere else, it being now one-third less than before the establishment of those institutions. Thus we see that properly conducted sanatoria for consumptives not only serve as hygienic educators to individuals and families, but as instructors in hygiene to

whole communities. The example in scrupulous cleanliness set by employes and inmates of such sanatoria thus bears the best fruits. The same cannot be said of open health resorts, where the regulations concerning the expectoration are less severe. In these places the mortality from tuberculosis has increased among the native population since they have been frequented by consumptives. I am able to substantiate this statement by letters addressed to me by Dr. Ballestre, of Nice, France, and Dr. Atkins, of Las Vegas, New Mexico, both health officers of their respective localities. Recent personal inquiries in some of the boarding-places in the Adirondacks where consumptives congregate, outside the jurisdiction of the sanatorium, indicate, I am sorry to say, the same condition there.

And now, Mr. President and gentlemen, let us in conclusion treat the most difficult part of our discourse, that is to say, the social and economical aspect of the tuberculosis problem.

Let us take for illustration a community of 1,000,000 inhabitants. With an average death rate of 25 per 1,000, one-fifth of whom die from tuberculosis, the community would lose 5,000 a year from this disease.

Some sanatoria claim as many as 70 per cent. of cures when the patients are admitted to treatment in the incipient stages, and I have reason to believe that these figures are exact, for pulmonary tuberculosis in the earlier stages is indeed one of the most curable of all chronic diseases. But let us presume a percentage of fifty only. Thus if these 5,000 had been placed at the onset of their disease under proper treatment in sanatoria, 2,500 human lives would surely have been saved. Statistics have amply shown that tuberculosis is most prevalent among the poorer classes. The relation is about as two to one. So I believe that I am nearly right when I say that of those 5,000 over 3,000 at least are of the poorer classes, and of these 2,000 have died most likely in public institutions.

From personal experience gained in some of the larger general hospitals in Europe and in the United States I have learned that a tuberculous patient rarely makes a continuous stay in one hospital. He usually improves after his first sojourn and leaves, only to turn up after a few months in the same or another hospital for a second period of rest, and so on. But, all in all, the time he spends in general hospitals, to which he is usually admitted when in the advanced stage, is rarely less than fifteen months.

According to the last published annual report of the commissioners of public charities and correction of the City of New York for the year 1895, the daily expense per capita in the general hospitals of that city is \$1.16. Thus the patient costs the municipality up to his death \$522, aside from the money expended on the family of the patient, should the latter have been its only bread winner.

The general hospitals claim few cures of pulmonary tuberculosis, and it seems almost as if this money had been uselessly spent, since a general hospital cannot even be considered a safe place for isolating a consumptive. If the same patient had, for example, been treated at the Adirondack Cottage Sanatorium or at a similar institution, and been sent there at an early period of his disease, he would have had 60 per cent. more chances of recovery, and would have cost only \$1 a day, and that during a period of perhaps only six or nine months.

Thus two thousand tuberculous patients treated in the general hospitals in the City of New York, with very little chance of being cured, but with much chance of doing harm to their fellow-patients suffering from acute diseases, cost the city \$1,044,000. Treated in sanatoria or special hospitals, with 20 to 50 per cent. of chances of recovery, according to the stage of their disease, and even if we should allow them just as long a stay in the special institution as we grant to the advanced cases in general hospitals, the cost would be only \$890,000. Thus, with a

saving of at least \$150,000, and the saving of hundreds of lives, countless centers of infection would be extinguished, which otherwise would endanger the families and neighbors of these tuberculous invalids.

But aside from that, think of the gain to the commonwealth by restoring to health the many bread winners whose families, under the present conditions, might become a burden to the community.

As stated above, these institutions should be open not only to the poor but also to those in moderate circumstances who can pay part of the expense. For this latter class of patients, many of whom for reasons of a noble feeling of independence hesitate to accept public aid, I have often wondered if a plan, something similar to the State invalidity insurance companies of Germany, could not be inaugurated in this country. There the moment an individual enters upon the career of an ordinary laborer or servant he is obliged to be insured against sickness, accidents, and old age. If he develops tuberculosis he is immediately sent to one of the many sanatoria of that country. The government authorities, who are at the head of this State insurance company, have long since learned that, through a timely treatment in a sanatorium, the tuberculous individual is most speedily and lastingly cured, and consequently with the least expense.

Dr. Weicker, of Goerbersdorf, to whose institution a great many such patients are sent by the government, writes me that the percentage of cures among these is higher than among the private patients. His latest statistics give a percentage of eighty of established cures, with only an average of seventy-six and one-half days of sojourn in the sanatorium. This marvelous result is to be explained by the fact that the government insurance officials send their patients to the sanatorium at much earlier periods than a private physician is likely to do.

Thirty-seven of these government insurance companies have, according to their published figures for 1897, collectively assisted 4,480 consumptives, of whom 4,432 were sent to subsidized sanatoria. Nearly all these State insurance companies contribute to the funds of such establishments; some have found it to their advantage to erect special sanatoria of their own. For the year 1897 these State insurance societies of Germany invested altogether 1,300,000 marks in sanatoria for consumptives, and for 1898 a fund of between three and four millions has been destined for that purpose.

How would it be if one of our most thickly populated States, after having created a number of sanatoria, should try the experiment of a State insurance company against tuberculosis? How many families, even of the classes in fair circumstances but in which tuberculosis is dreaded on account of the disease having been the cause of the death of some of their members, would not gladly avail themselves of this opportunity—especially since the existing life insurance companies refuse applicants with a family history of tuberculosis? This opportunity, offered by the State, would mean giving to their children the certainty of being afforded the best possible chance of recovery, should they be taken down with the family disease. No matter at what age, as long as the individual remained insured, there would be the State sanatorium to receive and treat him. A payment of, for example, fifty cents a month from the birth of the child, would give to the State insurance company after fifteen years, with the accrued interest, a capital of nearly \$150. By paying the aggregate amount up to the date of application, any predisposed individual might be insured at any time, and such an institution be called into life at once.

The greatest chance of a predisposed individual being taken sick is between the age of puberty and thirty. The chances of the disease becoming healed without ever having been discovered are between 20 and 25 per cent. I am in a position to verify this percentage by statistics which I compiled for my book on tuberculosis. Besides reviewing the

vast literature on the subject I addressed three hundred letters of inquiry to the leading pathologists of the world, and as a result I can say that out of every one hundred autopsies made on people having died accidentally, or of diseases other than tuberculosis, twenty to twenty-five showed evidences of healed tuberculous lesions (cicatrization or calcareous formation). The chances of this disease being cured in from six to nine months, if it is discovered at an early period are at least 50 per cent. It is not necessary to be an insurance expert to see by these figures that the State would hardly be a great financial loser by creating such an insurance institution. But the greatest benefit which would accrue to the State or commonwealth through such an enterprise would be the paving of the way toward a complete State or municipal control of tuberculosis among the population which, owing to their social conditions, could otherwise not properly be cared for, and would constitute forever an impediment to the thorough prophylaxis and possible eradication of the disease.

To carry on the various State or municipal institutions to be erected, with a view to effectually stamping out tuberculosis, a large staff of competent physicians would be needed. These physicians should be paid for their labor. It is inevitable that through taking thousands of patients into such institutions the general practitioner will lose some of his income. Let the State compensate him by paying him for the service he may render in any of the institutions (sanatoria, hospitals, or special dispensaries) created by the State with the view of combating tuberculosis.

To proceed with this work as soon as possible, I should suggest transforming some especially favorably located general hospitals into special hospitals for consumptives. Create sanatoria for children on the seashore, for adults in mountainous or at least in elevated and healthy regions. If your State or provincial funds are not large enough to meet the demand, appeal to some of the many generous and patriotic philanthropists, whose hearts and hands are ever open when there is a question of saving American lives. In 1896 Vaughan, writing on the restriction of tuberculosis, said: "Of the 63,000,000 people living to-day in the United States, 9,000,000 or more will die of tuberculosis unless something is done to prevent it." Let us do that something—let us do it soon and let us do it well—so that with the dawn of the new century we may hope to see the tuberculosis problem solved, at least in North America; solved by the most humanitarian method, thanks to the combined efforts of physicians, statesmen, philanthropists, health officers of States, provinces, and cities, and the good will of an intelligent people.

955 Madison Avenue.

Dr. S. A. Knopf, New York: I met Dr. Johnson, of Illinois, this morning, and he showed me a receptacle for sputum, which I recognized as one of my old models. He asked my permission to exhibit it here this afternoon. Now I happen to have with me a later, and, I think, much improved model. When I showed it to Dr. Johnson, and later to Dr. Baker, they both requested me to demonstrate myself the mechanism of the flask before you. But before doing so, will the members of the Conference kindly allow me to say a few words on the subject of expectoration? In most sanatoria for consumptives, provisions are made for the care and destruction of the pulmonary and bronchial secretions, while the patient is inside of the institution. But I regret to say

that in several such establishments, especially in our own country, no provision is made with regard to the care and destruction of sputa, expectorated when outside of the hospital or sanatorium. In one institution, which I recently visited in the State of New York, the name of which I do not wish to mention, but which is called a hospital for consumptives, you find all over the house printed regulations, concerning the care and destruction of expectoration. These rules explain to the patient what to do with his sputum, while on the premises; not a word is said, however, what to do with his expectoration when outside of the institution. What do you think has been the consequence? I was told that not far from that institution lived a farmer who had a small herd of healthy cows, all tested by tuberculin. Owing, undoubtedly, to the careless expectoration of these patients, while out walking in the vicinity of the hospital, inside of six months three of those cows were infected with tuberculosis. I believe this is one case where tuberculosis was transmitted from man to animal, through careless expectorating. In Germany and France the inmates of such institutions are required to carry glass flasks, and always expectorate in them when they cannot conveniently get at the stationary spittoons. This rule holds good, no matter where the patient may find himself. These flasks, the so-called Dettweiler "Hustenflaschen," made of glass and white metal, weighing nearly 7 ounces, are $4\frac{1}{2}$ inches high and have a diameter of $2\frac{1}{2}$ inches. They are oval in shape, and consist of three pieces. Before describing my own flask, which is really only a modification of the one invented by my esteemed teacher, Prof. Dettweiler, of Falkenstein, I wish to make a short plea for sympathy for the poor consumptive, whom we expect to abide faithfully by the most stringent rules concerning his expectoration. Some time ago, while riding in a New York street car, after simulating a cough, I took out a pocket flask and expectorated into it. I wish you could have seen the eyes turned on me and heard the ungenerous remarks, which, though spoken in whisper, nevertheless reached my ear, and you would have learned to feel more sympathy for the poor consumptive. The difficulty of dissimulating the heavy oval Dettweiler flask, and the fact that, being of glass, in case of its breaking while filled with expectorated matter, the patient would be exposed to local tuberculous inoculation, caused me to endeavor to devise something, if possible, more safe and more practical. After much experimenting, I believe to have solved the problem at last, and I take pleasure to present to you this flask, made of aluminum. As you see, it is constructed like

Dettweiler's, on the principle of an irreversible inkstand. It is, however, simpler in its construction, being composed of only two pieces. I have done away with the opening at the bottom, being unnecessary and complicating the manipulating of the flask. Instead of 7 ounces, it weighs but 2. Its length is 4 inches, and its nearly uniform diameter is but $1\frac{3}{4}$ inches. While the cubic contents is the same as the glass flask, it is less bulky, and can be manipulated with more ease. The lid flies open at a slight pressure of the thumb of the right hand, and is pushed down by the index. Thus only one hand is needed for its manipulation, and it can easily be hidden in the folds of a handkerchief. It can also be cleaned easily and disinfected by unscrewing the top and putting the flask and its contents in boiling water. To make sure of killing the bacilli, I recommend the addition of some carbonate of soda to the water to increase the boiling point to nearly 102 degrees centigrade, at which temperature the tubercle bacillus is surely destroyed. I wish to add that I have prevented the possibility of the flask ever becoming patented, by the proper measures taken before the Commissioner of Patents at Washington. Anyone who desires may manufacture it, but it cannot be patented. I present it cheerfully herewith to the sanitary authorities of North America.

Dr. P. H. Bryce, Ontario: I would like to ask Prof. Knopf why a piece of tissue paper would not answer as well as a flask.

Dr. S. A. Knopf, New York: You could not use tissue paper; it is too permeable.

Dr. Bryce: It is permeable only to water. You can take three or four sheets of tissue paper, about six or eight inches square. It is easily carried, easy to use, and can be burned when occasion requires. There is another thing which I should consider objectionable in the flask, and that is, it would be almost impossible to expectorate into it—at least it would be for a man with a mustache. I would certainly prefer to recommend the tissue paper.

Dr. Knopf: My patients have no trouble in using the flask, and they wipe the lips with a handkerchief.

Dr. Bryce: Then they must carry two handkerchiefs.

Dr. Knopf: They should do so. I always tell my tuberculous patients never to use the same handkerchief for wiping their nose that they use to wipe their mouths after having expectorated. If possible, they should also have two pocket flasks, so as never to be without any while one is being cleaned. Con-

cerning the danger of infection through the mustache, mentioned by Dr. Bryce, I should suggest that consumptives either wear clipped mustaches or none at all. Furthermore, I should think that the use of paper would be wholly impracticable when the expectoration is very liquid and abundant, which is not infrequent with consumptives. There is another advantage which a flask possesses—that is, its convenient use at night. The patient places the flask under his pillow, and can, under the protection of his bed cover, raise himself and expectorate in his little flask. The window being constantly open, this precaution will protect him against any danger of becoming chilled.

Dr. Bryce: The tissue paper could be used in the same way also.

Dr. Knopf: Not with the same certainty of preventing infection. I could talk half an hour on this subject, but I fear to trespass on your valuable time. I will only summarize by saying that to my mind the use of a properly constructed pocket flask is far cleaner, more hygienic, and a surer means of prophylaxis than the use of tissue paper for the purpose of gathering expectorated tuberculous matter.

DR. KNOPF'S DISCUSSION OF REPORTING CASES.

Permit me in a few words to express my views on this delicate subject of the compulsory reporting of pulmonary tuberculosis as a contagious disease. When I was younger and less experienced I was in favor of a measure making the reporting of pulmonary tuberculosis obligatory on the part of the general practitioner, on the same ground that he should report cases of smallpox, yellow fever, diphtheria, etc. Riper experience has changed my opinion in this respect. My reasons for this are as follows:

1. Pulmonary tuberculosis is not a contagious disease, but only communicable; the contact *per se* of a consumptive individual does not transmit the disease.
2. The scrupulous care and destruction of tuberculous expectoration and other secretions suffices to do away with all danger of infection and transmission.
3. Pulmonary tuberculosis is a chronic disease, lasting often for years, and once reporting it at a given time, and even the one and usually only visit on part of a sanitary inspector, can have no lasting effect in the prevention of tuberculosis.
4. The tuberculosis patient who is likely to propagate his disease in the most extensive and dangerous way is not the con-

sumptive unable to move about, and confined to one or a few rooms, but the relatively well tuberculous individual who, though expectorating daily millions of bacilli, is often still able to attend to his occupation. Such a person, even when his case has been reported to the Board of Health, and when he has been visited once by the sanitary inspector, can change his residence, and none of his neighbors will have an idea of the danger they are in if the newcomer is unscrupulous with his expectoration.

5. While some Boards of Health refrain from sending a sanitary inspector when this is expressly stated as undesired in the family physician's report, some Boards maintain that it should be done in all cases. Only the physician, who in many cases is not only the medical advisor, but also the counselor and intimate friend of the family, will know that circumstances arise where the making public of the existence of a tuberculous disease in a family would mean disaster.

What, then, would remain to be done by the sanitary authorities in regard to this matter?

In the interest of demographical science, and in the hope of discovery of some of the underlying causes when the disease is seemingly confined to certain districts, all cases of tuberculosis should be reported. The reporting physician should receive printed measures how to insure a thorough prophylaxis, and also an offer that, if desirable, the sanitary inspector would visit the patient for the verbal instruction. It should be left to the discretion of the physician when and how often a disinfection of the patient's apartments during the course of his disease should take place. The disinfection of an apartment in which a consumptive person has died must, however, be enforced by law, and the physician should be held responsible that the authorities are notified of such a death. A disinfection should also be obligatory in case a room is vacated by a consumptive person; this should be especially enforced in the case of hotels, boarding-houses and health resorts. There should be no charge for disinfecting for the poor.

One of the vital duties of the Board of Health should be to inspect regularly all institutions which admit cases of pulmonary tuberculosis for treatment and care, and to insist upon a systematic carrying out of all the necessary precautions concerning prophylaxis. Only one who has visited, as I have done, many of the so-called "homes" or hospitals for consumptives, some even sailing under the name of sanatorium, where there is often not even a visiting, much less a house physician, can form an idea of the danger such an institution is to the community. All

the hygienic and prophylactic measures, which in an assembly of consumptives require a strong will and a thorough medical knowledge of one especially trained for this task, are left in the hands of a gentle priest, minister, sister superior or matron.

Dr. C. A. Lindsley, Connecticut: Mr. President and Gentlemen of the Conference—In responding to the request to open the discussion of the subject of the morbid anatomy of consumption, I feel justified in being brief from two reasons: one is because the very able, interesting and illustrated lecture to which you have just listened has practically covered all the ground necessary to the legitimate purposes of this Conference, and the other reason is because this Conference is not constituted to decide disputed questions in morbid anatomy, which can best be settled in chemical, bacteriological and anatomical laboratories. It is not our function to discuss such questions, but rather to confer together upon the practical exercise of our official duties as the administrators of public hygiene.

There are, however, some points in the morbid anatomy of tuberculosis which do concern us. Since the discovery of the actual cause of tuberculosis, we have made great progress in the means of restricting it. We know better than we did before how to do it. One thing which we have learned from the morbid anatomy is of signal value, and that is, the unity of the disease. This unit of infection is a most important point to practical sanitarians. We used to consider hydrocephalus a distinct disease. We know now that it is tuberculosis of the meninges of the brain. We know now that scrofula, which was formerly considered a special disease of the superficial glands, is tuberculosis of those glands; that tabes mesenterica is tuberculosis of the abdominal glands; that lupus and many other affections of the skin are also different forms of tuberculosis, and caused by the same identical germ which produces tuberculosis of the lungs. But this germ is so intimately associated with the morbid anatomy of the disease that the practical sanitarian is more interested in the biology of the germ, in whatever tissue it may be found, than in any phase of tissue changes.

The practical problem that confronts the sanitarian is, how to eliminate or prevent the spread of the disease by fighting and destroying its cause. Our efforts are directed by the knowledge that the cause is a living germ; that it can exist only under certain conditions; that it does not propagate itself outside the animal body; and that most warm-blooded animals are subject to the disease. We know that without this germ there is no tuberculosis; that the germ may enter the body in various ways,

but chiefly by inspiration in the lungs, or through the stomach with food or drink. But it is not in the body, in a pathogenic sense, until it has found some lesion or abrasion through which it can secure a lodgment in the tissues—a nesting-place, where it can set up the processes which have been so well described to you to-day. All that we know of the life-career of this most fatal enemy of mankind helps us in the contest. The special points are these: that when lodged in the living tissues of the human subject, or any warm-blooded animals, its reproductive power, although slow, is almost beyond enumeration; at the same time setting up inflammatory action, resulting in products which are thrown off through the natural passages, and which contain the fatal germs in countless numbers. This is where the health officer is brought in direct relation with the morbid anatomy of tuberculosis, to-wit, to see that the diseased tissues, loaded with the dangerous parasites, and thrown off from the infected subject, are absolutely destroyed and prevented beyond question from being a source of further infection to others. Special precautions are necessary, therefore, only when the tuberculous deposits are located in places adjacent to the natural outlets of the body, or where, as in the case of tuberculous joints or glands, a communication by ulcerative process has been established with the surface. It follows that tuberculosis of the brain is not an infectious disease, because the tubercle bacilli cannot possibly escape from the cavity of the cranium. Doubtless the most frequent source of infection is the dried sputa of pulmonary cases floating in the air as dust.

(Time limit of five minutes expired.)

Dr. P. H. Bryce, Ontario: Mr. President, Ladies and Gentlemen—We have listened this afternoon to a number of very able papers on this most important subject of tuberculosis, and it would be almost impossible to attempt a resume of all the phases of this question, which overshadows all other sanitary questions from the economic, social, individual and sanitary standpoints. Anyone who is familiar with the subject will realize what is involved in an attempt to deal with it in a broad, systematic manner. There are many phases to this subject—the duty of the physician and householder, the requisite notification, the inspection of hotels and houses, the regulation of expectoration, and above all things the sanitary control of boarding-houses and factories. And then there is the duty of the municipality with regard to inspection of meat and milk, and finally there is the most important matter—perhaps the most important

of all—the education of the general public and the individual of the importance of plain everyday hygiene. And this, after all, is the greatest of all sanitary measure which have for their object the cure and prevention of tuberculosis. We must educate the individual so that he will be able to guard himself against this most fatal disease. One important phase of this question was dwelt upon by Dr. Wingate this morning, namely, the influence of the nervous diseases upon consumption, and consumption upon the nervous diseases, and the connection between them seems to lie in the matter of malnutrition. If it is true that we cannot change our habits of life, our modern fast living, then we must take special pains to guard against individual predisposition towards innutrition and physical exposure to this disease, universally present, ready to make an onset if opportunity is offered.

I believe a great focus of infection is the public school. I do not suppose that there is much difference in the condition existing in the United States and in our country. The crowding of fifty or sixty children, with ages ranging from five, six to seven years, into rooms results in such becoming insanitary inside of ten minutes, and we, as sanitarians, should bring this matter forcibly to the attention of school teachers and school boards. And then we must follow the question a little further, as when the school children become young men and women. Is there any way in which we can control tendencies towards innutrition, the inevitable precursor of tuberculosis in some form or other? All these questions are wide-reaching in their importance, and it is in these initial stages that the best results can be obtained. Passing from the protection of those not infected, we must deal with the subject of prevention of further cases from those who are already infected; and in this we have duties not only as sanitarians, but as physicians in the saving of lives of those already diseased. I noticed, in listening to Dr. Formento's paper, that he did not deem it generally necessary for the case to be removed from the house. I take it that he meant isolation. I hope that he meant that. I would say that, taking the householder as we find him, and given the patient, the sympathetic mother, and loving sister or brother, and I know of no condition less favorable for a cure. I know nothing more dangerous to the well than the continued presence of sister or brother in a house under the usual conditions for the two years prior to the decease of the consumptive. Let us endeavor to find some sanitary means of dealing with this phase of the question. I believe that these patients should be treated in sanitoria which are under the gov-

ernment's supervision. I believe that these sanatoria can only be run properly under rigid government regulation and control; and if this is not done, I do not believe that satisfactory results will be obtained. I will illustrate what I mean in a case we have had in our own country. A sanitarium was built by philanthropists in the Muskoka country—an institution capable of accommodating some fifty patients, and which has cost fifty or sixty thousand dollars. Under the rather peculiar ideas of the executive, or those in charge, there have been three different physicians in charge during a single year, and they have had changes in the staff in various ways, while no regulations as to residence for any stated periods exist. Good results cannot to the desired extent be obtained under these conditions. The effect upon the reputation of the institution, unless under scientific medical supervision, must be very injurious. There is another incidental sanitary evil which is invading our Muskoka country, which is, of late years, becoming a very popular summer resort. Doctors say to their patients, "Go to the Muskoka," and we have had this summer, in many small boarding-houses and hotels, cases of secondary and tertiary stages of consumption, which are destroying the reputation of the region as a health resort, making the hotels dangerous, and doing no good whatever to the consumptives who go there temporarily. I think this matter should receive the attention of all sanitarians, but, recognizing the great difficulties of accomplishing anything by resolutions, I will not offer any, but have desired merely to draw the attention of the Conference to this phase of the subject.

Dr. Henry B. Baker, Michigan: Mr. President, I would suggest that Dr. Bryce be requested to offer a resolution covering the grounds, which he states he will refrain from doing. I hope he will consent to do so. It is a matter of exceeding importance. The passing of such a resolution would help us in our work right here in Michigan. It would be mutually helpful to every State Board.

Dr. Johnson, Illinois: I move that the Chair appoint a committee, consisting of Drs. Bryce, Baker, and one other, to draft such a resolution.

The motion was seconded and carried, and the Chair appointed Drs. Bryce, Baker and Swarts, who in due time presented the following resolution, which was, on motion, adopted:

Whereas, It is the unanimous voice of the Conference of State and Provincial Boards of Health of North America that, since tuberculosis, which causes on this continent more deaths than all other contagious diseases together, is now recognized by all scientific and medical authorities as both curable and preventable; and

Whereas, Since the onset of the disease depends especially upon hereditary weakness, and on malnutrition induced by overcrowding, bad ventilation and over-pressure in school, social and commercial life; and

Whereas, Since the presence in the homes of the poor of so many cases of this chronic disease means almost certain death to the patient, and probable infection of other members of the family; be it, therefore,

Resolved, That this Conference does publish, and instruct the Secretary to forward copies of these resolutions to the Legislatures, Departments of Education, and Municipal Authorities, of the several States and Provinces represented in the Conference, urging upon them the imperative need of,

1. Having all schools and colleges placed under medical supervision with regard to ventilation, over-crowding, and over-pressure in studies.

2. Having all hotels, boarding houses and workshops where consumptives may be employed placed under municipal supervision and inspection.

3. Urging all State Legislatures to devote public funds, and encouraging private philanthropy, in the establishment of homes or sanitaria in one or more counties or districts of the several States and Provinces to which patients may be sent early, either at their own or municipal expense, and under proper regulations be encouraged to remain therein until recovery shall have taken place, while at the same time, they shall have prevented the continuance of centers of infection in their homes.

Dr. C. A. Lindsley, Connecticut: I believe that this resolution should be in some way published at once. I do not think it should be held until published in the regular proceedings. I move that the Secretary prepare copies of this resolution at his early convenience, and send them to every State and Provincial Board of Health, that they may have opportunity to bring the matter before their Legislatures.

Motion was seconded and carried.

Dr. Felix Formento, Louisiana, Vice-President, took the chair, and Dr. Benjamin Lee read extracts from a report of the Pennsylvania Society for the Prevention of Tuberculosis, and, upon motion, it was voted that the entire report be referred for publication.

Dr. R. H. Lewis, North Carolina, offered the following resolution, which was, on motion, adopted:

Whereas, The members of the Conference of the State and Provincial Boards of Health, as practical health officers, have for years viewed the work of the Michigan State Board of Health with admiration, receiving in many instances inspiration therefrom; and

Whereas, We desire to give expression to our appreciation; therefore, be it

Resolved, That the Conference heartily congratulates the State Board of Health of Michigan upon the completion of the first quarter-centennial of its admirable work for humanity, and cordially wishes it continued rapid progress in the noble cause to which it is devoted.

Dr. Guilbert, Iowa, offered the following resolution, which was, upon vote, adopted:

Resolved, That the hearty thanks of this Conference are extended to Dr. Knopf, of New York; Mr. Williams, of Michigan; Dr. Wynn, of Indiana, and Dr. Salmon, of Washington, for their valuable contributions and discussions which added greatly to the success of this meeting.

Dr. Felix Formento, Louisiana, offered the following resolution, which was, upon motion, adopted:

Resolved, That the thanks of this Conference be extended to the Mayor and citizens of Detroit for their generous hospitality, to the local press for their correct reporting of our meetings, and to Messrs. Parke, Davis & Co. for the cordial reception and splendid entertainment offered by them to the members of this Conference.

Dr. William Bailey, of Kentucky, offered the following resolution, which was, upon motion, adopted:

Resolved, That this Conference expresses its deep sorrow at the death of Dr. J. Berrien Lindsey, of Nashville, Tenn., long-time Secretary of his State Board of Health, an active and useful member of this Conference, and whose life was devoted to sanitary work.

Dr. C. A. Lindsey, Connecticut, offered the following resolution, which was, upon motion, adopted:

Resolved, That the special thanks of this Conference be given to His Honor, Mayor Maybury, Mr. Haigh, Dr. Connor, Dr. Shirrill, Dr. Hitchcock, and the local committees, for the very satisfactory arrangements for our comfort, entertainment and convenient transaction of business; to Messrs. Parke, Davis & Co. for the donation of the program and other courtesies; to the President for his impartial, prompt and judicious management of our proceedings; to the Secretary and Treasurer for careful work in the discharge of their respective duties; to the railroad companies for the reduction of rates; and to the press for giving to a wide circle of readers the salient portions of the papers and discussions.

On motion of Dr. Probst, of Ohio, it was voted that the determination of the next place of meeting be left to the judgment of the Executive Committee.

On motion of Dr. Probst, of Ohio, it was voted that the rate of assessment for the ensuing year be left to the judgment of the Executive Committee.

The next order of business was the election of officers, which resulted as follows:

President—Dr. Felix Formento, Louisiana.

Vice-President—Dr. F. H. Bryce, Ontario.

Secretary—Dr. J. N. Hurty, Indiana.

Treasurer—Dr. Elzear Pelletier, Quebec.

On motion the Conference adjourned.

APPENDIX.

The following volunteer papers were thankfully accepted and ordered printed:

REPORT OF THE NEW YORK STATE BOARD OF HEALTH CONCERNING BOVINE TUBERCULOSIS.

By S. CASE JONES, M. D., CHAIRMAN TUBERCULOSIS COMMITTEE.

Mr. President: I have been requested to present to this Conference a short paper reviewing somewhat the work of the New York State Board of Health in protecting the life and health of the public from the danger of infection from tuberculosis, which is now recognized by all sanitarians to be derived largely from the use of food products from tuberculous cattle.

It is not an easy task to present this subject in a new phase, nor to add any knowledge to the articles which have been so ably presented before, but the importance of spreading the light of scientific investigations relating to the etiology of tuberculosis more generally to the public mind, and demonstrating more and more the practical methods for suppressing bovine tuberculosis has led me to consent to add my mite in showing that New York State is still striving to keep the work alive.

In 1892 the Legislature of the State of New York enacted a law, giving the State Board of Health authority to investigate concerning the existence and cause of tuberculosis in cattle and the danger to the public health therefrom, and to use all reasonable means for averting and suppressing such disease. Such Board may cause all proper information in its possession respecting tuberculosis in cattle to be sent to the local Board of Health nearest to the cattle affected, and may add thereto such useful suggestions as to the removal of the source of danger therefrom or as to the destruction of such cattle, as to such Board may seem proper.

The local health authorities shall supply to the State Board of Health like information and suggestions respecting the existence of tuberculosis in cattle.

While the State law provides for appraisal and paying of indemnities for diseased cattle if the State Board deems it necessary to slaughter, it leaves the matter to the discretion of the State Board in using other measures to prevent the spread of the infection.

At first for the purpose of demonstrating the existence of bovine tuberculosis throughout the State during the years of 1893 and 1894 a considerable sum of money was expended by examining, condemning and paying indemnities. The postmortems were object lessons which served to educate the public that such disease really existed, and the writer believes that this is the greatest benefit obtained by the slaughter of tuberculous cattle. A skeptic is more thoroughly convinced of the existence and nature of the disease by witnessing one postmortem where the lesions are well demonstrated, than by any amount of scientific reasoning.

It was soon found that it would take millions of dollars and many years of labor to summarily slaughter all the tuberculous cattle in the State and pay the indemnities and costs and perhaps after all the same

work would need to be repeated in a few years. 22,000 cattle were examined by the New York State Board of Health and 800 were caused to be slaughtered. So important was the work considered that on May 31, 1894, a special commission was constituted to further inquire into the existence of tuberculosis in cattle, \$30,000 was appropriated for the use of this commission and the statute creating this commission limited its work to one year, as they were to make their report to the next Legislature, which report was submitted January 24, 1895.

In the general tabulated summary of the examinations made we find that this commission examined 2,417 cattle and 405 were condemned and slaughtered and this number was distributed through twenty-one counties. The report of this commission was a long and convincing argument, proving the dangerous character of the disease and a valuable document, inasmuch as it tended to bring the subject before the public. It set forth two methods, which they claim offered a reasonable expectation for the extinction of tuberculosis in our herds, namely:

First: The radical method by which all the herds in the State would be tuberculin tested, the diseased animals would be condemned, appraised, killed and safely disposed of, the premises disinfected and sanitary regulations provided for the care of the purified herds, but while this might be most efficient, it would involve a large immediate expense and the employment of a great number of skilled veterinary surgeons whose services might be difficult to secure.

Second: The progressive method, which was to employ one reliable veterinarian in each county or suitable district, whose duties would be to make and keep a census of all bovine animals, and a record of all additions, sales and deaths and to make a postmortem examination in case of any death from disease or slaughter because of disease; on the discovery of a specimen of tuberculosis, the inspector would submit this to the diagnosis of the chief veterinarian, and on his corroboration the whole herd in which such animal had been, would be tuberculin tested and those found tuberculous would be condemned, appraised and killed and safely disposed of and the premises disinfected. This would speedily purify all the dangerously affected herds and would not fail to sooner or later reach all herds in which any tuberculosis existed. This method would require an annual outlay of \$200,000, and suffice it to say the State Legislature were not sufficiently impressed with the force of the argument of the necessity of protecting the public health from this source of tubercular infection to make the appropriation to carry on the work.

The New York State Board of Health were left at the beginning of 1896 with a public health law giving them full power to investigate and send out inspectors but without an appropriation of any money to pay indemnities and they determined to carry on the work in an educational method. They appointed two members of the State Board, to be known as the Tuberculosis Committee, to carry out the provisions of the public health law relating to tuberculosis in cattle. Such committee were to keep a complete record of the work done and submit monthly reports thereof to the State Board of Health.

They established a bureau of information, getting into correspondence with local Boards of Health, veterinarians, and also cattle owners themselves; sending to them circulars of information regarding the disease and the best method of treating it, urging them to report to the committee all herds where there was any suspicion of tuberculosis and offering to assist any cattle owner who wished to have his herd examined by sending an expert veterinary to give the tuberculin test free of charge if they would quarantine or destroy all animals found diseased.

We found that wherever dairymen had had an experience of the disease among their cattle and had become acquainted with the infectious nature of tuberculous animals, they became convinced that the sooner

such infection was removed and destroyed the more secure and profitable became their herds and dairy products.

Tuberculosis does not prevail among all herds in the State, yet when infected animals are introduced, the infection spreads rapidly, especially when diseased and healthy animals are closely confined together in the same building, eating and drinking from common receptacles, by breeding from infected animals, and by feeding the milk of tuberculous cows to calves and pigs, or by allowing swine to feed on offal of slaughtered tuberculous cattle.

The Tuberculosis Committee have, during the past year, examined many herds connected with public institutions, such as the Orphan Asylums and State Hospitals for the Insane; and in two of the State Hospitals the whole herds have been destroyed and new herds started from tuberculin tested cattle. The work connected with State institutions furnishes the very best lessons to the public, and radical work can be accomplished among them without any real hardship, because the loss of slaughtered cattle does not fall on any single individual, at the same time it guarantees to the inmates a pure and wholesome milk supply.

The Willard State Hospital, at Willard, New York, gives the best lesson of what may be accomplished in stamping out tuberculosis. As long ago as 1882 their herd was very badly infected and upon a physical examination 50 per cent. were condemned and slaughtered and the autopsies verified the diagnosis of tuberculosis in every case. This herd being so badly infected it was deemed best to destroy the entire herd. At the time they were slaughtered it was shown that even the foetuses of tuberculous cows were infected, showing that the disease may be hereditary also, and that it is unsafe to try breeding from infected animals.

After destroying the entire herd, the barn in which they were kept stood empty for one year, and no animals were allowed to run in the pastures. In the meantime the barn was thoroughly cleansed and disinfected with a solution of chloride of zinc, and the next year a new herd of cattle was purchased and each animal carefully examined at the time of purchase. From this new herd breeding has been carefully carried on for ten years and at the present time the entire herd is one that has been raised on the farm. On the 17th and 18th of December, 1897, this entire herd of 154 animals, for the most part milch cows, was tested by tuberculin and all found free from tuberculosis.

It was with much satisfaction both to the Tuberculosis Committee of the New York State Board of Health and the authorities of the Willard State Hospital that this condition was found. The steward, Captain Gilbert, very heartily welcomed the examination and approved the action of the committee in freeing all State herds of any infected cattle. A number of cattle will soon be purchased and added to the herd to introduce a new strain of blood and the steward will require that each animal shall have passed the tuberculin test before they are accepted.

The examinations were made by Prof. James Law; the one fourteen years ago by physical examination alone, it being before the discovery of tuberculin; and the other in December last when he employed the tuberculin test.

In his report, Professor Law says, "The value of the example lies in this; that on a farm with a herd as badly infected as it was possible to be, a complete extinction of the disease has been accomplished without the use of the tuberculin test. It entailed, it is true, the ruthless destruction of the whole infected herd, and the enforcement of measures of segregation, and disinfection of the strictest possible kind, but it stands as a splendid example of success through the adoption of an intelligent and scientific method which might be applied with equal success to other herds in similar circumstances.

"The measures adapted in these cases are not superseded by the use of tuberculin, since segregation, destruction, and disinfection are demanded equally with tuberculin and without. But to make thorough

work without tuberculin, it is usually necessary, in order to secure prompt results, to do as was done with the Willard Hospital herd and ruthlessly destroy every animal.

"A slower method is to weed out promptly every unthrifty animal, and all that show unequivocally even suspicious symptoms of tuberculosis, and to employ disinfectants freely on the stall, stable, and yards. With tuberculin, on the other hand, in a herd that is not universally infected, it is easy to pick out the tuberculous animals, and to place the sound ones in a herd by themselves, which may be tested again and again at long intervals until we are satisfied that no trace of infection is in any way connected with them.

"With tuberculin, success can be made more prompt and certain, and with a limited destruction of the herd, while without it, a shadow rests upon all the survivors for a considerable length of time. With tuberculin, an animal can be taken from even an infected herd with a reasonably certain guarantee of soundness, whilst without it, the survivors of a herd which is infected to even a slight extent cannot for years, or so long as infection survives in the herd, be considered as safe to purchase.

"While, therefore, we admit the possibility of successfully dealing with tuberculosis without the tuberculin test, and avail of it when circumstances demand it, we cannot close our eyes to the fact that for intelligent, scientific and effective work, the tuberculin test is by far the preferable resort, though never to the exclusion of professional skill and sound judgment in other directions."

We believe that this demonstration will encourage the State to proceed in the work of exterminating tuberculosis among cattle and in doing this, the spread of tuberculosis in the human family is certain to be greatly diminished. In the light of experience and investigations of recent years, it is unquestionably shown that milk and flesh of tuberculous animals are a great source of infection to man. And it is the duty of the State Boards of Health to demand in the strongest terms possible the destruction of this infection. The fruit of our educational work is plainly seen in the better and growing appreciation by cattle men of the nature and danger of tuberculosis, as shown by the more frequent reports of the disease, and the constantly increasing number of applications for the tuberculin test by men who know that we have no funds with which to indemnify them for cattle condemned.

During the past year several owners of small herds were induced to have their herds tested at their own expense, and in this way several tuberculous animals were detected and destroyed. We find cattle owners who are willing to bear the expense of testing their own cattle, are invariably willing to destroy any found diseased. We again see the result of our educational work brought about by the distribution of our circulars of information and instruction; one veterinarian alone having sent us several reports of private tuberculin tests, which he believes he has obtained through our circulars, which he has distributed to his patrons.

We have received many calls for these circulars from veterinarians and health officers, which they desire to distribute to inquiring dairy-men.

During the last season, our inspector, Dr. Cooper Curtice, has spent some time in Buffalo investigating a report in one of our agricultural papers, that traffic was being carried on there, by the stock men, in tuberculous cattle shipped there from other States. It transpires, that a cow tagged "Condemned," by the Bureau of Animal Industry Officials, was recently sold in Buffalo, and afterwards died with what was reported to be tuberculosis. The investigation of our inspector shows that she died of some other disease. He also learned that she was only condemned for beef, because she was in an advanced stage of pregnancy, and not because she was diseased.

The Bureau of Animal Industry Officials inspect all cattle imported for breeding purposes from Canada, and accept the certificates of tuberculin inspections from Canadian veterinarians, who have had the endorsement of the Provincial Government. If the cattle are not accompanied by such certificate, they are held for ninety-four days and inspected here.

The inspection and condemnation of an animal recently shipped from Canada in advanced tuberculosis, would throw in question the integrity of at least one of the Canadian inspectors, and cast suspicion upon the accuracy and efficiency of the Canadian work, and until further observations have proven the Canadian inspectors inaccurate or unfaithful in their work, their inspections for tuberculosis must be regarded as correct and of much value to the cattle industry in this State. The main bulk of milk cows sold in Buffalo, do not pass through the hands of the Bureau officers for tuberculin inspection. Such cattle come largely from Iowa, Indiana, Illinois, Ohio and elsewhere. If destined for Massachusetts or Pennsylvania they are inspected in Buffalo, by inspectors designated by authorities from those States, although cattle owners are obliged to pay for the inspection.

These inspectors are for this purpose practically State agents. They certify to the health of the cattle sent into those States, and reject all tuberculous cattle, refusing to tag them. This procedure results in the exportation of sound cattle, and the throwing of the tuberculous into the New York herds.

The accusation that owners willfully dispose of these tuberculous cattle in opposition to the laws of the State, and all humane sentiment, we are not yet able to prove in any given instance, but it is a matter of common report among those closest to the transaction.

Of all cattle thus examined, from 7 to 10 per cent. are said to be rejected, and so far as can be learned, none are killed. Cattle thus submitted to the State are almost always apparently in good condition, about to calve, or are fresh in milk, and really form a dangerous class which the State has been striving to keep from the channels of traffic. The rejected cattle go one by one, or in groups of two and three, to dairies or breeders' herds, and introduce disease into those herds much faster than would be the case were there no inspection for Massachusetts, Pennsylvania, Vermont and other States.

Veterinarians who make these inspections we think would be willing to report these cases, were there a general law covering them, and demanding of all veterinarians that such cases should be reported. At present none wish to risk the loss of other business which would follow the reporting of these cattle under present conditions. We learn that the Interstate-commerce Law interferes with our demanding that the authorities of other States test all cattle coming to this State, and send with them a certificate of health.

It is obviously impossible with the small amount of money at our disposal, to keep at Buffalo and other places, inspectors to examine and tuberculin test the cattle designed for dairy or breeding purposes. Under existing laws, it seems to us a matter for the Bureau of Animal Industry to take charge of, and we believe it is a matter of much greater importance from a sanitary standpoint, as well as of value to the cattle industry, than the inspection of beef cattle now so carefully carried on by their department.

Under the law, we are permitted to kill all tuberculous cattle and if in the possession of the owner for a period of less than three months they cannot ask for appraisal or indemnity. We are looking for just such cattle, and any such found will be promptly destroyed.

The conditions before mentioned are becoming known to dairymen and dealers in our State, many of whom will not purchase cattle that have not passed the tuberculin test, and when all dairymen and breeders

have attained intelligence enough to do this, no cattle will then be brought into the State, without having first been tested, for if tested in this State and rejected, they must be a total loss to their owners, or be sent back to the State from whence they came.

**CONTRIBUTION OF DR. BENJAMIN LEE, OF PHILADELPHIA,
TO THE DISCUSSION OF THE QUESTION, PHASE VII, "HOW
MAY TUBERCULOSIS BE PREVENTED?"**

The Pennsylvania Society for the Prevention of Tuberculosis was organized April 10, 1892, and incorporated 1895. The following is the report for the year ending April 13, 1898. The Publication Committee calls attention to the statement of the illustrious Pasteur that "It is in the power of man to cause all parasitic maladies to disappear from the world." Thoroughly believing this doctrine, the Society for the Prevention of Tuberculosis has worked quietly with but one end in view—namely, the education of the community in a knowledge of the true nature of consumption, and of the means now considered necessary to control or conquer this disease.

The Society for the Prevention of Tuberculosis has worked quietly with but one end in view—namely, the education of the community in a knowledge of the true nature of consumption and of the means how considered necessary to control or conquer this disease.

The means by which this end is sought to be obtained are: 1st, By the publication and distribution of pamphlets; 2d, by constant efforts to induce those in influential positions to use their earnest efforts to prevent the spread of the disease; and 3d, by striving to obtain the requisite conditions whereby those early afflicted may be restored to usefulness, or when far advanced, the safeguarding that will prevent the communication of infection to others.

During the past year one new pamphlet has been published, Tract No. 4, "How Storekeepers and Manufacturers Can Help to Prevent the Spread of Tuberculosis;" 5,000 copies of this have been issued and 20,000 copies of earlier tracts have been reprinted and extensively circulated and copied. The chief effort of the managers, however, has been directed towards the establishment of the greatly needed Municipal Hospital for Tuberculous patients, and also for a sanatorium in the high regions of the State.

The former of these is needed for two reasons—1st, the comfort and last retreat of the poorest members of our community who after months and years of struggle find themselves at last penniless, absolutely unfit for work and refused admission to the general hospitals of the city.

The hospitals of the city cannot admit all the cases of tuberculosis that apply to them; their wards would be crowded to the detriment of the acute cases of other diseases. The Home for Incurables is full and has always a long waiting list. The Free Hospital Fund for Poor Consumptives has undertaken, as far as its means permit, to pay for consumptive patients who are received in a special ward of St. Agnes Hospital. The Rush Hospital will take cases for a limited time, and the City Mission, by a few beds at 411 Spruce Street and its fine Home at Chestnut Hill—this latter only for women—provides for a number of sufferers. At the Philadelphia Hospital certain wards are reserved for consumptives, but even with these the accommodation is not nearly sufficient for the size of our city.

For their own sake, such patients should have better air and sanitary conditions than are possible in an almshouse hospital; for the sake of the community they should be treated by such methods as will not only tend to cure certain cases but will prevent the contagion from spreading.

We feel convinced that a State sanatorium in the highlands would save many valuable lives and also that a good City Hospital set apart for

tuberculous patients would not only give comfort to them but add greatly to the safety of the (apparently) healthy part of the community.

A most desirable location in Luzerne county has been offered the Society for the site of a sanatorium, and strong efforts are being made to obtain State aid to erect the building. In December, 1896, a committee was appointed by the Society to make a report on a suitable site for such an institution. Accordingly a committee of four members visited White Haven, in Luzerne county, Glen Summit and Bear Creek and neighboring localities within a radius of from twenty to thirty miles. The place which appeared to present the greatest advantages was situated quite near White Haven, a borough composed of educated and progressive people, and in touch with all the great railroad systems of the State. This is an important matter, as it would diminish the sense of isolation on the part of the patients, attendant upon removal to a wilderness or a dense forest remote from civilization and difficult of access. The point selected is about 1,225 feet above the level of the sea, and 250 feet above the Lehigh river. Green Mountain rises gently from the borough of White Haven until at an elevation of 100 feet above the town it forms a plateau, a few hundred feet in width, stretching westward indefinitely. It is on this plateau that it is proposed to locate the sanatorium. The prevailing winds of this locality are northwest, and the sanatorium would be protected from them by Green Mountain, which rises rather abruptly from the plateau some 400 feet, and passes westward continuously with the plateau. It thus affords admirable shelter from the wind. The sun exposure is all that could be desired. The outlook is to the south and the plateau is bathed continuously with sunshine, from daylight to dark. The view is out over a wide stretch of wilderness, east, west and south. From the top of Green Mountain there is a charming prospect towards every point of the compass. The soil is porous, and the drainage good. With the exception of a clearing on the plateau which is occupied as a farm, the mountain side is wooded. It is the natural home of the pine, though the extensive lumbering operations which brought White Haven into being, have long since brought about an almost entire disappearance of this beneficent tree, whose varied products, by some strange chemistry of nature, have ever been found to be so healing in affections of the respiratory tract.

For purity of atmosphere the locality is up to a high standard, and is pronounced practically free from miasmic and malarial influences.

The condition of dry atmosphere is fairly present. The fogs are not frequent, nor are they extensive or continuous. They mostly originate in the condensation which takes place in the moisture arising from the river, but they do not last long nor do they usually reach to the plateau.

The tract consists of several hundred acres, and it has been offered free of expense and encumbrance to the Society, on the simple condition that they shall raise the funds for building and equipping the institution. The matter having been brought to the notice of the Board of State Charities, from the fact that it is intended to make this more especially a refuge for the consumptive poor of our large cities, that body recommended an appropriation of \$30,000, provided a like amount could be raised by private subscriptions. The Committee on Appropriations of the Legislature, however, reported the bill negatively. The movement having once been inaugurated, however, will not be suffered to drop.

The first difficulty in carrying out the objects of the Society is the immense number of persons suffering from tuberculosis. Even if we consider only those who actually die of this disease each year, we find that for the State of Pennsylvania it is an army equal in numbers to that of its National Guard. What consternation would ensue, what measures would not be undertaken if we might suppose the disease to cease for ten years and then be restored in its full measure of mortality!

The second element of difficulty is the apathy of our people. They have not begun to grasp the idea that tuberculosis is one of the preventable diseases. They look upon the mortality from phthisis as a part of an inevitable tribute to death that must be paid because it always has been paid with such a remarkable regularity that one is able to foretell very closely just how many will die of phthisis in the year. We know now, and we were morally certain at the opening of the year, that in Philadelphia about 2,350 would die of phthisis in 1898. But in Philadelphia the rate has fallen gradually so that, whereas, fifteen years ago about 14 per cent. of all deaths were from phthisis now only about 10 per cent. was from that cause. The reason is that, as in other warfare, "To know the enemy is half the battle." So the fuller knowledge of the way in which the disease is propagated from the sick to the well enables us in some measure to avoid distributing broadcast the germs of the disease, and, on the other hand, to avoid receiving them with a strange indifference which does not seem to exist in our relations to other diseases. An institution for the scientific treatment of tuberculosis is a great object lesson on the means of prevention of the spread of the disease as well as its cure. The sanatoriums in the Adirondack Mountains, at Chestnut Hill in Philadelphia, in England, the Isle of Wight, and on the continent of Europe, by exerting a strict supervision of their patients, teach them how the disease can be managed and the dangers of its communication destroyed. So it would be with an institution of this kind if established in any locality. Those who go out relieved or cured would aid in all measures calculated to diminish the disease.

The Society has made a strong effort to limit the evil of expectoration in public places. The Board of Health was requested by this society to consider the advisability of issuing circulars or public notices to be properly distributed, warning against the uncleanly, unnecessary, unhealthful and reprehensible practice of spitting, especially by consumptives, in public places, thoroughfares and conveyances. The Board of Health published "The Spitting Habit," and thousands of copies were widely distributed; accordingly every street car in Philadelphia is now provided with a sign authorized by the Board of Health forbidding the practice of spitting upon the floor.

The State Live Stock Sanitary Board of Pennsylvania has now been in operation for about two and a half years and much of its work has been in connection with the suppression of tuberculosis of cattle. Since its establishment it has caused the condemnation and destruction of over 3,500 tuberculous cattle. This work is justified both from the standpoint of public health and from the standpoint of agriculture. In the first place the ingestion of the meat or milk of tuberculous animals may produce tuberculosis in the consumer, and in the second place this disease is quite contagious among cattle and causes very great losses to farmers. Inspections of tuberculous herds have been made by the State Veterinarian in all parts of Pennsylvania under the supervision of the State Live Stock Sanitary Board. Herds have been found in which the percentage of tuberculosis has been extremely high. In one herd of fifty-six cattle recently examined fifty-three were afflicted with tuberculosis and killed. The average percentage, however, is steadily falling and while the proportion of infected cattle in infected herds was as high as 30 per cent. in the beginning of the work it has been reduced to about 10 per cent., showing that the herds in which infection is most extensive are being discovered and disposed of. In some parts of the State there is very little, if any tuberculosis of cattle, and the same condition prevails in many herds in districts in which tuberculosis is most abundant. The absence of tuberculosis seems to depend upon freedom from exposure and the prevalence of tuberculosis depends upon care that the animals receive and the conditions to which they are subjected and the length of time that the outbreak has remained undisturbed. Many cases

have been observed in which calves and swine have become infected with tuberculosis through the consumption of skimmed milk from creameries supplied in part with milk from tuberculous cows. The danger of infection from milk or meat can only be avoided by obtaining these important foods from animals that are known to be healthy, or by destroying by heat the germs that they may contain.

Much progress is being made in the suppression of this important disease of domestic animals and this progress is due to several lines of work. In the first place tuberculous herds are inspected and diseased animals are destroyed outright, thus removing all danger that may accompany their existence. The premises occupied by such animals are thoroughly disinfected. The owners of cattle are placed on guard and upon the first appearance of tuberculosis they take precautions to prevent its spread. Great attention is being paid to sanitary condition of stables and farmers are now enabled to purchase cattle that are proven free from tuberculosis by application of tuberculin test as a result of the enforcement of the new law requiring inspection of all dairy cows and cattle for breeding purposes coming into Pennsylvania from other States.

The State Live Stock Sanitary Board is now engaged in some research work carried on for the purpose of discovering more as to the exact manner in which tuberculosis is transmitted from animal to animal, the infectiousness of the breath, saliva and secretions of tuberculous animals, the infectiousness of the milk at different stages of disease and the discovery of practical methods for the prevention of the spread of tuberculosis in infected herds.

In the beginning of this work there was some opposition to it by farmers on the ground that it is not necessary and would cause them financial loss. That they now appreciate its importance and benefits is shown by the fact that the State Veterinarian receives fully three times as many voluntary applications for examinations of herds as can be made with the funds at the disposal of the State Live Stock Sanitary Board.

CONSTITUTION.

Article I. The name of this Society shall be the Pennsylvania Society for the Prevention of Tuberculosis.

Art. II. The Society is formed for the purpose of preventing tuberculosis (consumption): 1st, By promulgating the doctrine of the contagiousness of the disease; 2d, by instructing the public in practical methods of avoidance and prevention; 3d, by visiting the consumptive poor and supplying them with the necessary materials with which to protect themselves against the disease, and instructing them in their use; 4th, by furnishing the consumptive poor with hospital treatment; 5th, by co-operating with Boards of Health in such measures as they may adopt for the prevention of the disease; 6th, by advocating the enactment of appropriate laws for the prevention of the disease; 7th, by such other methods as the Society may from time to time adopt.

BY-LAWS.

ART. I. MEMBERS.

Any person who shall pay one dollar or more into the treasury of the Society shall be enrolled as a member for the year in which such payment is made.

ART. II. OFFICERS AND THEIR DUTIES.

Section 1. The officers of the Society shall be a President, three or more Vice-Presidents, a Secretary, a Treasurer, a Solicitor, and a Board of Directors.

Sec. 2. The President, Vice-Presidents, Secretary, Treasurer, and Solicitor shall perform the customary duties of their respective offices.

Sec. 3. The Board of Directors shall consist of fifteen members. It shall have entire control of the business of the Society and of the expenditure of its funds, except where otherwise provided for by the By-Laws; and it shall appoint such subordinate officers and agents as shall be necessary to carry out the work of the Society.

ART. III. MEETINGS.

Section 1. The Society shall meet annually on the second Wednesday in April.

Sec. 2. The Board of Directors shall meet regularly on the second Wednesday of every second month, beginning May 10, 1892.

Sec. 3. The Secretary shall call a special meeting of the Board at the written request of three members.

ART. IV. ELECTIONS.

The officers and Board of Directors shall be elected annually at the meeting of the Society in May. All vacancies shall be filled by the Board until the next annual meeting.

ART. V. EXPENDITURES.

Section 1. At each regular meeting of the Board of Directors all money in the treasury beyond that which is necessary for defraying the general expenses until the next regular meeting of the Board shall be set aside to be used as a Hospital Fund.

Sec. 2. When the money in the Hospital Fund shall amount to \$150 or more, a tuberculous patient shall be placed in a hospital for every \$150 in the fund.

ART. VI. AMENDMENTS AND NEW BY-LAWS.

New By-Laws may be adopted or amendments made by a majority vote of the Board of Directors.

MISSISSIPPI RIVER QUARANTINE STATIONS.

By DR. J. J. CASTELLMANOS, NEW ORLEANS.

Mr. President and Gentlemen of the Conference—Answering your question as to whether the "State of Louisiana has some principal line of work which reaches nearer to perfection than the work of any other sister Board," I beg leave to state that, waiving odious comparisons, and in view of the benefit that is expected to accrue from the collective reports of our Boards, I will endeavor my utmost to comply with the demand. First and foremost, the Louisiana State Board of Health rightfully claims the undisputed prerogative of having been the first inaugurator of the present methods of disinfection, especially such as are connected with maritime quarantine sanitation. To Dr. J. C. Holt, of New Orleans, is unquestionably due the credit of having introduced them, after a most earnest and trying series of experimentation. Nor should Dr. C. R. Wilkinson, our present resident at the lower Mississippi quarantine station, nor should also Dr. Olliphant, our last year's retiring President, be ungratefully forgotten for their respective contributions toward the perfecting of the above-mentioned methods. Several other sanitarians might also be mentioned whose services our State Board is proud to recognize—but I must not be led away into digressions, and must refrain from now entering into what may be considered as the history of disinfection. Already long experience has satisfactorily confirmed the efficiency of our methods to shut out infection and contagion from our port. From a total of 2,500 ships disinfected at his station, Dr. C. Wilkinson records but three exceptional cases on which yellow fever

subsequently broke out. Quite lately the sulphur fumigation furnace, which produces 50 per cent. of S.O₂, has also been improved by a return pipe conveying the impure air in the ship's hold back into the furnace, to be purified and subsequently consumed for the production of the above gas. To Dr. C. Wilkinson we are indebted for the addition of moist to dry heat in the disinfecting cylinder.

The thoroughness of our disinfecting methods has in a great measure contributed to dispel much of the anxiety born of doubt as to the real value of our former methods and disinfecting agents. It has also led to some lessening of the detention period, thus reducing it from five to three days. In fact, so great is the trust we rest upon our maritime quarantine system of sanitation that we contemplate a still greater reduction in the detention period in the case of our tropical fruit vessels that ply and trade between this port and those of Central America. The perishable nature of their cargo, mainly consisting of bananas, their previous disinfection, both as to ship and crew, after leaving the infected ports, their detention at sea on their homeward trip—all these are considered as so many factors that may work out some degree of assurance. Owing to present exceptional circumstances, we have thus far this year deferred to a not very distant future period the carrying out of the quarantine relaxation above mentioned. For a long time it was a mooted question whether bananas were liable to disinfection, as any other cargo. Attempts in the latter direction were followed by such damages to the fruit as to justify indemnity suits. Lately, in view of their being cut down far beyond the reach of infection, in the neighboring country along the Central American coast, and being speedily transported by rail to the dock, and there handled by a special gang previously disinfected by our local medical representative stationed at each respective quarantinable port.

I have deemed it necessary to enter into this detailed explanation because of the commercial and sanitary problems that are yearly in conflict with one another, owing to this special class of trade.

I need not refer to our management of yellow fever epidemics, as I am convinced they have already been made familiar to you all. The articles unanimously adopted at the Atlanta Convention bind all the Gulf and South Atlantic States by a solemn compact. The importance to be derived from unanimous action of these States, who are ever so likely to suffer from yellow fever importation, is sufficient assurance against any violation of the trust that was pledged on that occasion.

We are all well aware that a new heat chamber, consisting of a double or jacketed cylinder with apparatus for producing vacuum inside of the cylinder, has been lately introduced. If I mistake not, the credit of the innovation is due to Dr. Doty, of New York City. The vacuum is produced either by means of the air-pump or the steam exhaust, the former being the more efficient, as a vacuum of twenty-six inches (the nearest approach to a possible ideal of thirty inches) has been obtained by it. The steam exhaust is, however, sufficiently perfect, and gives a vacuum of from fifteen to twenty inches. It is much quicker, less costly, and does not easily get out of order. A vacuum pump of high pressure requires more attention to keep in order. Dr. R. H. Carter, of the Marine Hospital Service, to whose ability and energy we are so much indebted in our part of the country for the radical extinction of the McHenry epidemic, has largely contributed to popularize the vacuum system, such as it was introduced by Kenyon and Francis, together with the steam jet exhaust of Walk and Murdock, of Charleston, S. C. The application of the same principle (vacuum) to enhance the penetration of formaldehyde was introduced by Kenyon, and is in use in New Orleans and detention camps, as also in some quarantine stations under the supervision of the Marine Hospital Service.

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